Appendix A Combined Sewer Outfalls				
Outfall ID	Location	Receiving Stream	Latitude	Longitude
A-01	Barbeau Street (COP)	Allegheny River	40.44309	-80.00800
A-02	Fancourt Street (COP)	Allegheny River	40.44341	-80.00678
A-03	Evans Way (COP)	Allegheny River	40.44363	-80.00581
A-04	Stanwix Street (COP)	Allegheny River	40.44384	-80.00485
A-05	Cecil Place (COP)	Allegheny River	40.44402	-80.00385
A-06	Sixth Street (COP)	Allegheny River	40.44418	-80.00339
A-07	Barkers Place (COP)	Allegheny River	40.44455	-80.00195
A-08	Scott Place (COP)	Allegheny River	40.44469	-80.00149
A-09	Seventh Street (COP)	Allegheny River	40.44484	-80.00103
A-10	Eighth Street (COP)	Allegheny River	40.44515	-80.00010
A-11	Ninth Street (COP)	Allegheny River	40.44548	-79.99902
A-12	Garrison Place (COP)	Allegheny River	40.44576	-79.99829
A-13	Tenth Street (COP)	Allegheny River	40.44639	-79.99661
A-14	12th Street (COP)	Allegheny River	40.44762	-79.99442
A14Z	11th Street and Smallman Street (COP)	Allegheny River	40.44551	-79.99407
A-15	14th Street and river bank (COP)	Allegheny River	40.44916	-79.99194
A-16	17th Street (COP)	Allegheny River	40.45160	-79.98830
A-17	20th Street (COP)	Allegheny River	40.45293	-79.98641
A-18	24th Street (COP)	Allegheny River	40.45530	-79.98306
A-18Z	22nd Street and Railroad Street (COP)	Allegheny River	40.45414	-79.98307
A-18Y	23rd Street and Railroad Street (COP)	Allegheny River	40.45528	-79.98142
A-18X	25th Street and Railroad Street (COP)	Allegheny River	40.45348	-79.98381
A-19Z	26th Street and Railroad Street (COP)	Allegheny River	40.45624	-79.98003
A-19Y	27th Street and Railroad Street (COP)	Allegheny River	40.45721	-79.97866

A-19X	28th Street and Railroad Street (COP)	Allegheny River	40.45819	-79.97717
A-20	30th Street (COP)	Allegheny River	40.46104	-79.97575
A-20Z	29th Street (COP)	Allegheny River	40.45910	-79.97576
A-21	31st Street (COP)	Allegheny River	40.46228	-79.97440
A-22	32nd Street (COP)	Allegheny River	40.46327	-79.97299
A-23	33rd Street (COP)	Allegheny River	40.46409	-79.97183
A-25	36th Street (COP)	Allegheny River	40.46915	-79.96727
A-26	38th Street (COP)	Allegheny River	40.46696	-79.96925
A-27	40th Street (COP)	Allegheny River	40.47151	-79.96592
A-28	43rd Street (COP)	Allegheny River	40.47361	-79.96462
A-29	48th Street (COP)	Allegheny River	40.47854	-79.96157
A-29Z	49th Street (COP)	Allegheny River	40.47841	-79.95924
A-30	51st Street (COP)	Allegheny River	40.48088	-79.95933
A-31	52nd Street (COP)	Allegheny River	40.48280	-79.95743
A-32	McCandless Street (COP)	Allegheny River	40.48377	-79.95573
A-33	54th Street (COP)	Allegheny River	40.48487	-79.95380
A-34	55th Street (COP)	Allegheny River	40.48540	-79.95233
A-35	57th Street and River Crossing (COP)	Allegheny River	40.48686	-79.94831
A-36	62nd Street (COP)	Allegheny River	40.48969	-79.93810
A-37	Voltz Way (COP)	Allegheny River	40.49013	-79.93577
A-37Z	120 ft Upstream of A-37 (COP)	Allegheny River	40.49020	-79.93562
A-38	Gatewood Way (COP)	Allegheny River	40.49014	-79.93038
A-40	Chislett Street (COP)	Allegheny River	40.48911	-79.92315
A-41	Heths Avenue (COP)	Allegheny River	40.48796	-79.91879
A-42	Negley Run (COP)	Allegheny River	40.48257	-79.90849
A-47	Itasco Street (COP)	Allegheny River	40.44575	-80.00705
A-48	Dasher Street (COP)	Allegheny River	40.44609	-80.00535
A-49	Federal Street (COP)	Allegheny River	40.44670	-80.00360

A-50	Sandusky Street (COP)	Allegheny River	40.44716	-80.00202
A-51	Anderson Street (COP)	Allegheny River	40.44753	-80.00057
A-55	Grantham Street (COP)	Allegheny River	40.44829	-79.99846
A-56	Goodrich Street (COP)	Allegheny River	40.44871	-79.99767
A-58	Madison Street (COP)	Allegheny River	40.44978	-79.99530
A-59	Warfield Street (COP)	Allegheny River	40.45094	-79.99354
A-59Z	Chestnut Street and Saw Mill Run Way (COP)	Allegheny River	40.45279	-79.99244
A-60	Spring Garden Avenue (COP)	Allegheny River	40.45385	-79.98996
A-61	Pindham Street (COP)	Allegheny River	40.45600	-79.98729
A-62	McFadden Street (COP)	Allegheny River	40.46028	-79.98208
A-63	Emma Street (COP)	Allegheny River	40.46347	-79.97980
A-64	Rialto Street (COP)	Allegheny River	40.46459	-79.97913
A-65	Heckelman Street (COP)	Allegheny River	40.46760	-79.97673
A-66	Freid and Reineman (Millvale Borough)	Allegheny River	40.46979	-79.97411
A-67	Girty's Run (Millvale Borough)	Allegheny River	40.47569	-79.96838
A-68	Pine Creek (Etna Borough)	Allegheny River	40.48924	-79.95104
A-69	5th Street (Sharpsburg Borough)	Allegheny River	40.49288	-79.93575
A-70	Davidson Street (Sharpsburg Borough)	Allegheny River	40.49293	-79.93455
A-71	13th Street (Sharpsburg Borough)	Allegheny River	40.49327	-79.92949
A-72	16th Street (Sharpsburg Borough)	Allegheny River	40.49287	-79.92523
A-73	19th Street (Sharpsburg Borough)	Allegheny River	40.49231	-79.91822
A-74	22nd Street (Sharpsburg Borough)	Allegheny River	40.49184	-79.91570
A-75	Western Avenue (Aspinwall Borough)	Allegheny River	40.48963	-79.90772
A-76	Center Avenue (Aspinwall Borough)	Allegheny River	40.48919	-79.90604
A-77	Eastern Avenue (Aspinwall Borough)	Allegheny River	40.48867	-79.90402
A-78	Brilliant Avenue (COP)	Allegheny River	40.48842	-79.90126
C-02	West Carson Street (COP)	Chartiers Creek	40.46475	-80.05332
C-03	Sloan Way (COP)	Chartiers Creek	40.46467	-80.05368

C-03A	C-03A Approx 450 ft. above W Carson St.(McKees Rocks Borough); Outfall 006	Chartiers Creek	40.46506	-80.05404
C-04	McKees Rock Redevelopment (McKees Rocks Borough)	Chartiers Creek	40.46494	-80.05420
C-05	Stafford Street at Elliot Warehouse (COP)	Chartiers Creek	40.46215	-80.05607
C-05A	Stafford Street (COP)	Chartiers Creek	40.46357	-80.05685
C-06	Linen Street (McKees Rocks Borough)	Chartiers Creek	40.46372	-80.05785
C-07	Ohio Conn. Ry Culvert (COP)	Chartiers Creek	40.46190	-80.06066
C-08	Left bank, rear of Singer Ice Co. (McKees Rocks Borough)	Chartiers Creek	40.46441	-80.06046
C-09	Federal Enameling & Stamping (McKees Rocks Borough)	Chartiers Creek	40.46444	-80.06084
C-10	Fort Pitt Malleable Co. (McKees Rocks Borough)	Chartiers Creek	40.46114	-80.06959
C-11	10 ft Arch Culvert (COP)	Chartiers Creek	40.46056	-80.07018
C-12	Railroad Yard (COP)	Chartiers Creek	40.46119	-80.07311
C-13	L.B. under PC&Y RR bridge (McKees Rocks Boro)	Chartiers Creek	40.46355	-80.07398
C-13A	Scully Railroad Yard (COP); Outfall 007	Chartiers Creek	40.46001	-80.08770
C-14	Mazette Road (COP)	Chartiers Creek	40.44925	-80.08904
C-15	Broadhead Fording Road (COP)	Chartiers Creek	40.44452	-80.08575
C-19	State Hwy. Bridge (COP)	Chartiers Creek	40.44028	-80.08133
C-20	Roswell Drive (Crafton Borough)	Chartiers Creek	40.44021	-80.08055
C-22	Crafton Borough Sewer (Crafton Borough)	Chartiers Creek	40.43575	-80.07486
C-23	RB 1550 ft U/S Crafton Sewer (Crafton Borough)	Chartiers Creek	40.43164	-80.07507
C-24	PCC & St. L. RR Bridge (COP); serves C-24 and C-25 structures	Chartiers Creek	40.42094	-80.08272
C-26A	Idlewild Road (COP)	Chartiers Creek	40.42087	-80.07482
C-27	Pringle Way (COP)	Chartiers Creek	40.41870	-80.07510
C-28	Moffat Way (COP)	Chartiers Creek	40.41797	-80.07549
C-29	Woodkirk Street (COP)	Chartiers Creek	40.41727	-80.07625
C-30	Whiskey Run, R.B. approx 120 ft U/S of PC&Y RR bridge (COP)	Chartiers Creek	40.41583	-80.07778
C-31	PA Parkway Bridge (Scott Township)	Chartiers Creek	40.41254	-80.08025
C-34	Elm Street (Carnegie Borough)	Chartiers Creek	40.41232	-80.08260

C-34A	Carnegie CSO (Carnegie Borough)	Chartiers Creek	40.41214	-80.8269
C-35	Chestnut Street Bridge (Carnegie Borough)	Chartiers Creek	40.41133	-80.08390
C-36	Walnut Street (Carnegie Borough)	Chartiers Creek	40.41053	-80.08598
C-37	Broadway Street (Carnegie Borough)	Chartiers Creek	40.41003	-80.08731
C-38	Pine Street (Carnegie Borough)	Chartiers Creek	40.40958	-80.08801
C-38A	Campbells Run (Carnegie Borough)	Chartiers Creek	40.40724	-80.08839
C-39	Third Avenue (Carnegie Borough)	Chartiers Creek	40.40563	-80.08806
C-40	Trimble Avenue (Carnegie Borough)	Chartiers Creek	40.40560	-80.08382
C-41	PCC & St. L. Ry. Bridge (Carnegie Borough)	Chartiers Creek	40.40286	-80.08715
C-43	Carothers Street Bridge (Carnegie Borough)	Chartiers Creek	40.40237	-80.08882
C-44	Fourth Street (Carnegie Borough)	Chartiers Creek	40.40184	-80.08992
C-51	Right bank, at Sipes Paint Company (Scott Township)	Chartiers Creek	40.37556	-80.09694
M-01	Short Street (COP)	Monongahela River	40.43884	-80.00779
M-02	Stanwix Street (COP)	Monongahela River	40.43808	-80.00596
M-03	Wood Street (COP)	Monongahela River	40.43686	-80.00292
M-04	Grant Street (COP)	Monongahela River	40.43541	-79.99934
M-04Z	Cherry Way and Westbound Roadway (COP)	Monongahela River	40.43636	-79.99994
M-05	Try Street (COP)	Monongahela River	40.43427	-79.99712
M-06	S. First Street (COP)	Monongahela River	40.43124	-79.99999
M-07	S. Fourth Street (COP)	Monongahela River	40.43113	-79.99538
M-08	S. Sixth Street (COP)	Monongahela River	40.43109	-79.99369
M-10	S. Eighth Street (COP)	Monongahela River	40.43126	-79.99120
M-11	S. Tenth Street (COP)	Monongahela River	40.43139	-79.98872
M-12	S. 13th Street (COP)	Monongahela River	40.43180	-79.98543
M-12Z	S. 11th Street (COP)	Monongahela River	40.43002	-79.98761
M-13	S. 15th Street (COP)	Monongahela River	40.43205	-79.98339
M-14	S. 17th Street (COP)	Monongahela River	40.43204	-79.98174
M-15	S. 19th Street (COP)	Monongahela River	40.43235	-79.97881

M-15Z	S. 18th Street (COP)	Monongahela River	40.43183	-79.98028
M-16	S. 20th Street (COP)	Monongahela River	40.43238	-79.97722
M-17	S. 21st Street (COP)	Monongahela River	40.43231	-79.97595
M-18	S. 22nd Street (COP)	Monongahela River	40.43206	-79.97446
M-19	Brady Street and River Crossing (COP)	Monongahela River	40.43442	-79.97294
M-19A	Bates Street (COP)	Monongahela River	40.43511	-79.96672
M-19B	Second Avenue and Maurice Street (COP)	Monongahela River	40.43218	-79.95884
M-20	S. 23rd Street (COP)	Monongahela River	40.43160	-79.97273
M-21	S. 24th Street (COP)	Monongahela River	40.43102	-79.97038
M-22	S. 25th Street (COP)	Monongahela River	40.43052	-79.96854
M-23	S. 26th Street (COP)	Monongahela River	40.43017	-79.96717
M-24	Waterworks Way (COP)	Monongahela River	40.42744	-79.96193
M-26	S. 30th Street (COP)	Monongahela River	40.42687	-79.96124
M-27	S. 33rd Street (COP)	Monongahela River	40.42410	-79.95831
M-28	S. 34th Street (COP)	Monongahela River	40.42274	-79.95763
M-29	Four Mile Run (COP)	Monongahela River	40.42463	-79.95297
M-31	Rutherglen Street (COP)	Monongahela River	40.41882	-79.94886
M-31Z	Rutherglen Street (COP)	Monongahela River	40.41883	-79.94876
M-32	Tullymet Street (COP)	Monongahela River	40.41317	-79.95150
M-33	Longworth Street (COP)	Monongahela River	40.41125	-79.95143
M-34	Beck's Run (COP)	Monongahela River	40.41121	-79.95474
M-35	Hazelwood Avenue (COP)	Monongahela River	40.40969	-79.95098
M-36	Tecumseh Street (COP)	Monongahela River	40.40702	-79.95042
M-37	Melancthon Street Ejector Station (COP)	Monongahela River	40.40389	-79.94889
M-38	Vespucius Street (COP)	Monongahela River	40.39901	-79.94312
M-39	Renova Street (COP)	Monongahela River	40.39849	-79.94150
M-40	Alluvian Street (COP)	Monongahela River	40.39870	-79.93644
M-42	Streets Run (COP)	Monongahela River	40.39345	-79.93304

M-43	Mesta Street (West Homestead Borough)	Monongahela River	40.40048	-79.92427
M-44	West Run (West Homestead Borough)	Monongahela River	40.40513	-79.92120
M-45	Homestead (Homestead Borough)	Monongahela River	40.40931	-79.91701
M-47	Nine Mile Run (COP)	Monongahela River	40.41599	-79.91563
M-48	Swissvale (Swissvale Borough)	Monongahela River	40.41679	-79.89437
M-49	Whitaker Run (Munhall Borough)	Monongahela River	40.41031	-79.89234
M-50	Rankin-Swissvale (Rankin Borough)	Monongahela River	40.41385	-79.88693
M-51	Rankin-Braddock (Braddock Borough)	Monongahela River	40.40577	-79.87716
M-52	Second Street (Braddock Borough)	Monongahela River	40.40444	-79.87550
M-53	Fourth Street (Braddock Borough)	Monongahela River	40.40316	-79.87391
M-54	Fifth Street (Braddock Borough)	Monongahela River	40.40257	-79.87311
M-55	Sixth Street (Braddock Borough)	Monongahela River	40.40114	-79.87122
M-56	Seventh Street (Braddock Borough)	Monongahela River	40.40003	-79.87025
M-57	Eighth Street (Braddock Borough)	Monongahela River	40.39903	-79.86930
M-58	Ninth Street (Braddock Borough)	Monongahela River	40.39723	-79.86758
M-59	11th Street Overflow (Braddock Borough); Outfall 005	Monongahela River	40.39528	-79.86578
M-60	Eleventh Street (Braddock Borough)	Monongahela River	40.39526	-79.86630
M-61	Thirteenth Street (North Braddock Borough)	Monongahela River	40.39396	-79.86258
O-01	Cole Avenue & Island Avenue (Stowe Township)	Ohio River	40.48921	-80.07999
O-02	Davis Alley (Stowe Township)	Ohio River	40.48756	-80.07359
O-03	Orr Street (Stowe Township)	Ohio River	40.48611	-80.07096
O-04	1000 ft D/S from River Crossing (Stowe Township)	Ohio River	40.48672	-80.06601
O-05	At River Crossing (Stowe Township)	Ohio River	40.48555	-80.06282
O-05A	D/S of Orchard Street (Stowe Township)	Ohio River	40.48464	-80.06126
O-05B	U/S of Orchard Street (Stowe Township)	Ohio River	40.48414	-80.06044
O-06	Shingiss Street (McKees Rocks Borough)	Ohio River	40.47070	-80.05157
O-08	Tabor Street, Outlet U-2 (COP)	Ohio River	40.46297	-80.05119
O-09	Frustum Street (COP)	Ohio River	40.46200	-80.05004

O-10	Earl Street (COP)	Ohio River	40.46037	-80.04790
O-11	W. Carson St.& Edgecliffe St. (COP)	Ohio River	40.45643	-80.04255
O-13	Cork's Run (COP)	Ohio River	40.45397	-80.03984
O-14Z	Steuben St. and Saw Mill Run Blvd. (COP)	Saw Mill Run	40.44392	-80.02946
O-14E	W. Carson St. east side outfall (COP)	Ohio River	40.44412	-80.02714
O-14W	W. Carson St. west side outfall (COP)	Ohio River	40.44413	-80.02716
O-25	Jacks Run (COP)	Ohio River	40.48566	-80.04970
O-26	Verner Avenue (COP)	Ohio River	40.47789	-80.04608
O-27	Westhall Street (COP)	Ohio River	40.47208	-80.04326
O-29	Superior Street (COP)	Ohio River	40.46315	-80.03708
O-30	Island Avenue (COP)	Ohio River	40.46129	-80.03585
O-31	Seymour Street (COP)	Ohio River	40.45940	-80.03478
O-32	Branchport Street (COP)	Ohio River	40.45865	-80.03465
O-33	Adams Street (COP)	Ohio River	40.45738	-80.03450
O-34	Columbus Street (COP)	Ohio River	40.45641	-80.03436
O-35	Franklin Street (COP)	Ohio River	40.45449	-80.03400
O-36	Liverpool Street (COP)	Ohio River	40.45365	-80.03342
O-37	Pennsylvania Avenue (COP)	Ohio River	40.45256	-80.03268
O-38	North Avenue (COP)	Ohio River	40.45139	-80.03151
O-39	Western Avenue (COP)	Ohio River	40.44957	-80.02961
O-40	Chateau Street (COP)	Ohio River	40.44797	-80.02630
O-41	Belmont Street (COP)	Ohio River	40.44833	-80.02523
O-43	Walker Street (COP)	Ohio River	40.44578	-80.01923
S-17	100 ft upstream of McNeilly Road (COP)	Saw Mill Run	40.37824	-80.00379
S-18	Maytide Street (COP)	Saw Mill Run	40.38556	-79.99444
S-23	Edgebrook Avenue East (COP)	Saw Mill Run	40.40229	-79.99938
S-24	Edgebrook Avenue West (COP)	Saw Mill Run	40.40164	-80.00264
S-28	Intervale at Saw Mill Run (COP)	Saw Mill Run	40.40801	-80.00415

S-29	Bausman at Saw Mill Run (COP)	Saw Mill Run	40.41098	-80.00620
S-30	125 Saw Mill Run (COP)	Saw Mill Run	40.41348	-80.00786
S-31	Buffington Avenue (COP)	Saw Mill Run	40.41481	-80.00963
S-32	Warrington at Saw Mill Run (COP)	Saw Mill Run	40.41489	-80.01209
S-33	Crane at Saw Mill Run (COP)	Saw Mill Run	40.41699	-80.01551
S-34	Weinman at Saw Mill Run (COP)	Saw Mill Run	40.41914	-80.01526
S-35	Soffel at Saw Mill Run (COP)	Saw Mill Run	40.42019	-80.01443
S-36	Spahgrove at Saw Mill Run (COP)	Saw Mill Run	40.42223	-80.01573
S-38	Woodruff Street (COP)	Saw Mill Run	40.42601	-80.01853
S-39	921 Saw Mill Run (COP)	Saw Mill Run	40.42725	-80.02163
S-01A	Woodruff St Interceptor Relief Overflow (COP)	Saw Mill Run	40.42601	-80.02078
S-40	Garage at Tunnel (COP)	Saw Mill Run	40.43084	-80.02719
S-41	Shaler at Wabash (COP)	Saw Mill Run	40.43279	-80.02968
S-02A	McKnight St Interceptor Relief Overflow (COP)	Saw Mill Run	40.43438	-80.03196
S-42A	Greentree at Woodville (COP)	Saw Mill Run	40.43542	-80.03390
S-42	Greentree at Woodville (COP)	Saw Mill Run	40.43541	-80.03389
S-46	Sanctus and Main (COP)	Saw Mill Run	40.44170	-80.03273
S-03A	Main Street Interceptor Relief Overflow (COP)	Saw Mill Run	40.44200	-80.03174
T-01	Docker Hollow (North Braddock Borough)	Turtle Creek	40.39525	-79.84721
T-02	Main Street (East Pittsburgh Borough)	Turtle Creek	40.39297	-79.83929
T-03	Braddock Avenue (East Pittsburgh Borough)	Turtle Creek	40.39369	-79.83656
T-04	R. B. Turtle Creek 30 E. Pitt Sewer (East Pittsburgh)	Turtle Creek	40.39634	-79.83246
T-07	R.B. D/S Thompson Run (Turtle Creek Borough)	Turtle Creek	40.40259	-79.82850
T-10	Grant Street and Turtle Creek (Turtle Creek Borough)	Turtle Creek	40.40426	-79.82649
T-11	Penn Avenue Highway Bridge (Turtle Creek Borough)	Turtle Creek	40.40348	-79.82444
T-12	Eleventh Street (Turtle Creek Borough)	Turtle Creek	40.40311	-79.82346
T-13	Ninth Street (Turtle Creek Borough)	Turtle Creek	40.40230	-79.82269
T-14	Line Alley (Turtle Creek Borough)	Turtle Creek	40.40089	-79.81931

T-15	4th St. and Airbrake Avenue (Wilmerding Borough)	Turtle Creek	40.39977	-79.81644
T-16	Left Bank Turtle Creek, 50 ft below RR Bridge (North Versailles Township)	Turtle Creek	40.39889	-79.81777
T-16A	Third Street (Wilmerding Borough)	Turtle Creek	40.39996	-79.81709
T-17	Second Street (Wilmerding Borough)	Turtle Creek	40.39949	-79.81604
T-19	Right Bank Under Viaduct (Wilmerding Borough)	Turtle Creek	40.39643	-79.81082
T-21	Right Bank Turtle Creek (Wilmerding Borough)	Turtle Creek	40.39562	-79.80770
T-22	L. B. Turtle Creek D/S Miller St. (Wilmerding Boro)	Turtle Creek	40.39505	-79.80723
T-23	Miller Street and Turtle Creek (Wilmerding Borough)	Turtle Creek	40.39492	-79.80655
T-24	Patton Street (Wilmerding Borough)	Turtle Creek	40.39458	-79.80483
T-26	D/S Bridge to Pitcairn RR Yards (Pitcairn Borough)	Turtle Creek	40.40106	-79.78223
TR-01	Turtle Creek Pump Station (Turtle Creek Borough)	Thompson Run	40.40461	-79.82768
TR-02	Church Street (Turtle Creek Borough)	Thompson Run	40.41219	-79.82432

Appendix B Sanitary Sewer Outfalls				
Outfall ID	Location	Receiving Stream	Latitude	Longitude
A-45	Fairview Avenue (Verona Borough)	Allegheny River	40.50071	-79.84673
A-82	First Street (Blawnox Borough)	Allegheny River	40.48758	-79.86513
A-85	Powers Run (O'Hara Township)	Allegheny River	40.50704	-79.85185
C-21	L.B., end of Thornburg Sewer opposite Crafton Borough Sewer (Thornburg Borough)	Chartiers Creek	40.43549	-80.07601
C-26	L.B. rear of Columbia Steel & Shafting Co, Foot of Arch St. ext (Rosslyn Farms Borough)	Chartiers Creek	40.42001	-80.07735
C-33	Vine Street (Carnegie Borough)	Chartiers Creek	40.41213	-80.08321
C-38B	Left Bank, at foot of Barrett Way (Carnegie Borough)	Chartiers Creek	40.40609	-80.08825
C-42	Right Bank, foot of Center Way (Scott Township)	Chartiers Creek	40.40207	-80.08848
C-45	RB, approximately 30 ft. U/S of West Main St. highway bridge (Scott Township)	Chartiers Creek	40.40015	-80.09690
C-45A	L.B., landward side of RR Culvert, approx 550 ft. U/S of highway bridge (Carnegie Borough)	Chartiers Creek	40.40053	-80.09850
C-46	Left Bank, end of Grant Avenue near RR Bridge (Heidelberg Borough)	Chartiers Creek	40.39364	-80.09900
C-47	R.B., across creek from American Steel Band Company (Scott Township)	Chartiers Creek	40.39517	-80.09207
C-48	R.B., approx 30 ft. D/S of East Railroad St. Highway Bridge (Scott Township)	Chartiers Creek	40.39482	-80.08749
C-49	R.B., approx 20 ft. D/S of Collier St. Highway Bridge (Scott Township)	Chartiers Creek	40.38715	-80.08893
C-50	L.B., approx 750 ft. D/S of Woodville Rd. Highway Bridge (Scott Township)	Chartiers Creek	40.38472	-80.09280
C-50A	R.B., approx 250 ft. D/S of Woodville Rd. Highway Bridge (Scott Township)	Chartiers Creek	40.38321	-80.09272
C-50B	R.B., approx 1400 ft. upstream of P.C.Y. RR Bridge (Scott Township)	Chartiers Creek	40.37774	-80.09441
C-52	L.B., approx 100 ft. D/S of P.C.C. & St. L. RR Bridge (Collier Township)	Chartiers Creek	40.37220	-80.09768
C-53	Approx 100 ft. D/S of mouth of Painters Run (Scott Township)	Chartiers Creek	40.36355	-80.09550
C-54	Right bank, mouth of McLaughlin's Run (Bridgeville Borough)	Chartiers Creek	40.36260	-80.10799
C-55	R.B., approx 120 ft. D/S of Pgh. W. Va. RR Bridge (Bridgeville Borough)	Chartiers Creek	40.35890	-80.12066
O-15	O-15 Outfall structure (Emsworth Borough)	Ohio River	40.50633	-80.08850
O-16	Western Avenue (Ben Avon Borough)	Ohio River	40.50608	-80.08784
O-17	Irwin Avenue (Ben Avon Borough)	Ohio River	40.50404	-80.08247
O-18	Spruce Run (Ben Avon Borough)	Ohio River	40.50323	-80.07926
O-18y	Cliff Street lateral (Ben Avon Borough)	Ohio River	40.50212	-80.07797
O-18z	Ridge Ave. lateral (Ben Avon Borough)	Ohio River	40.50256	-80.07922

O-19	Birmingham Avenue (Avalon Borough)	Ohio River	40.49874	-80.07226
O-20	Elizabeth Avenue (Avalon Borough)	Ohio River	40.49550	-80.06676
O-21	West Street (Avalon Borough)	Ohio River	40.49294	-80.06419
O-22	Meade Avenue (Bellevue Borough)	Ohio River	40.49141	-80.06242
O-23	South Fremont Avenue (Bellevue Borough)	Ohio River	40.48890	-80.05905
O-24	Shiloh Avenue (Bellevue Borough)	Ohio River	40.48753	-80.05684
S-15	200 ft. upstream of McNeilly Road (COP)	Saw Mill Run	40.37764	-80.00443
S-16	130 ft. upstream of McNeilly Road (COP)	Saw Mill Run	40.37777	-80.00440
SMR.CS-14	Interceptor Relief at Grove Road (Castle Shannon Borough)	Saw Mill Run	40.36802	-80.01399
SMR.CS-50	Interceptor Relief at Smith St. (Castle Shannon Borough)	Saw Mill Run	40.35690	-80.02913
SMR.CS-53	Interceptor Relief at Connor Rd. (Castle Shannon Borough)	Saw Mill Run	40.35591	-80.02882
T-08	L.B. Turtle Creek approx 300 ft. D/S from mouth of Thompson Run (North Versailles Township)	Turtle Creek	40.40272	-79.82777
T-18	Left bank under Viaduct (Wilmerding Borough)	Turtle Creek	40.39632	-79.81096
T-25	Left bank approx 400 ft. downstream of Wall Bridge (North Versailles Borough)	Turtle Creek	40.39430	-79.79954
T-26A	Moss Side Boulevard (Municipality of Monroeville)	Turtle Creek	40.39566	-79.77284
T-26B	S. Pitcairn connection for Monroeville Boro, just D/S of Bridge going to Pitcairn RR yards (Monroeville)	Turtle Creek	40.40127	-79.78030
T-27	Left bank under Pitcairn-Trafford Road Viaduct (Trafford Borough)	Turtle Creek	40.38674	-79.76409
T-29	Left bank approx 600 ft. D/S of Firth Sterling Company fence (Trafford Borough)	Turtle Creek	40.38951	-79.75582
T-29A	Left bank approx 200 ft. D/S of Firth Sterling Company fence (Trafford Borough)	Turtle Creek	40.38894	-79.75470
T-31	Right bank Brush Creek approx 250 ft. D/S from PA RR Bridge (Trafford Borough)	Turtle Creek	40.38434	-79.76619
T-32	Right bank Brush Creek approx 90 ft. upstream of PA RR Bridge (Trafford Borough)	Turtle Creek	40.38361	-79.76749
T-33	R.B. Brush Creek & Maple Street (Trafford Borough)	Turtle Creek	40.38225	-79.76889
TR-03	Larimar Ave. (Wilkins Township)	Thompson Run	40.41438	-79.82448
TR-04	Chalfant Run Culvert (Wilkins Township)	Thompson Run	40.42167	-79.81320
TR-05	Eastmont (Wilkins Township)	Thompson Run	40.43399	-79.80428
TR-06	Lick Run (Municipality of Monroeville)	Thompson Run	40.44330	-79.79725

APPENDIX C

Sensitive Areas (and Areas to be Treated as Sensitive Areas for Purposes of this Consent Decree Only)

Area Name	Mile Point	Descending Bank*	Description
ALLEGHENY RIVER			
Wilkinsburg-Penn Joint Water Authority	9.0	Left	Drinking Water Intake (DWI)
City of Pittsburgh	8.0	Right	DWI
Allegheny River Area No. 1	3.4 to 2.0	Right	Park and Marina
MONONGAHELA RIVER			
PA American Water Company	4.5	Left	DWI
Monongahela River Area No. 1	2.3	Left	Boat Ramp
Monongahela River Area No. 2	6.2	Left	Park
OHIO RIVER			
West View Water Authority	5.0	Upstream End of Neville Island	DWI
Municipal Authority of Robinson Township	8.6	Left; back channel of Emsworth Dam	DWI
Ohio River Area No. 1	0.0 to 1.0	Right	Parks

*Descending bank is referenced as moving downstream.

APPENDIX D

NPDES Permit

APPENDIX E

Regulator Capacity Evaluation and Modification

1. No later than one month from Date of Entry, ALCOSAN shall determine, based on design specifications, field surveys, and/or flow monitoring data, (a) the throughput flow rate capacity of each Regulator within the Conveyance and Treatment System and (b) the Peak Dry Weather Flow rate conveyed to that Regulator in a typical year based on historical flow monitoring data, or based on estimates, where flow monitoring data are not available.

2. Within 90 days of identifying any Regulator within the Conveyance and Treatment System having insufficient flow rate capacity to convey the equivalent of 1.5 times the Peak Dry Weather Flow rate, ALCOSAN shall identify all such Regulators to the Plaintiffs, in writing, and shall adjust such Regulators until each has sufficient capacity to convey 1.5 times the Peak Dry Weather Flow rate; provided, however, that if ALCOSAN demonstrates that such adjustment is technically infeasible, then ALCOSAN shall, within 12 months (or 18 months if ALCOSAN cannot obtain timely access to the Regulator) of identifying the Regulator as having insufficient capacity, either: (a) replace the Regulator with a new device having sufficient capacity to convey 1.5 times the Peak Dry Weather Flow rate; (b) modify the existing Regulator such that it has sufficient capacity to convey 1.5 times the Peak Dry Weather Flow rate; or (c) reduce the Peak Dry Weather Flow rate to a level that is at least 33% below the throughput flow rate capacity of the Regulator by removing sources of Inflow and Infiltration in the Regional Collection System through a cooperative effort with Customer Municipalities. Notwithstanding the foregoing, ALCOSAN may utilize a flow rate capacity of 1.25 times the Peak Dry Weather Flow rate for a given Regulator if ALCOSAN demonstrates in writing to the Plaintiffs that it is infeasible to replace, modify, or adjust that Regulator to convey 1.5 times the Peak Dry Weather Flow rate.

3. ALCOSAN shall propose, as part of its Wet Weather Plan and the Hydrologic and Hydraulic Model, an average flow rate capacity of no less than 1.5 times the Peak Dry Weather Flow rate for all of the Regulators in the Conveyance and Treatment System, although, as provided in the preceding Paragraph, ALCOSAN may utilize a flow rate capacity of 1.25 times the Peak Dry Weather Flow rate for a given Regulator if ALCOSAN demonstrates in writing to

the Plaintiffs that it is infeasible to replace, modify, or adjust that Regulator to convey 1.5 times the Peak Dry Weather Flow rate.

4. As soon as practicable after completion of Hydrologic and Hydraulic Model, ALCOSAN shall adjust, as necessary, the settings for Regulators within the Conveyance and Treatment System, and shall repeat these adjustments, as necessary, to maximize capture of Pollutants from the Regional Collection System, consistent with the Wet Weather Plan requirements in Paragraphs 16 through 18 of the Consent Decree. Such adjustments shall be made based upon then-current flow data and modeling information.

APPENDIX F

Reduction of Water Quality Impacts from Industrial Users

1. Within 180 days of the Date of Entry, ALCOSAN shall, for each Industrial User served by the Regional Collection System, submit the following information to the Plaintiffs:

   a. the location of the nearest downstream Combined Sewer Outfall and Sanitary Sewer Outfall (identified in Appendices A and B) through which the Industrial User's wastewater has the potential to discharge;

   b. the wastewater storage capacity available to that Industrial User, the maximum length of time that such amount can be stored by the Industrial User, and the extent to which the Industrial User maximizes such storage during wet weather (or if not known, measures proposed by ALCOSAN to obtain such information);

   c. for each Industrial User determine:

      i. the likelihood that its Discharge will reach waters of the United States through a Combined Sewer Outfall and/or Sanitary Sewer Outfall;

      ii. the volume (or estimated volume if not known) of the Industrial User's Discharge;

      iii. the potential environmental impact of the Industrial User's Discharge on receiving waters based on the characteristics of the Discharge, including but not limited to toxicity, pH, chemical oxygen demand, color, suspended solids, polychlorinated biphenyls ("PCBs"), and dissolved oxygen content; and

   d. the Combined Sewer Outfalls at which ALCOSAN will sample Discharges, in accordance with the Combined Sewer Overflow Pollutant Monitoring Plan required under Appendix O (Combined Sewer Overflow Pollutant Monitoring), to determine the extent to which untreated Industrial User wastewater discharged from Combined Sewer Outfalls impacts receiving waters.

2. Within 12 months after the submission of the information required pursuant to Paragraph 1 of this Appendix, and continuing annually thereafter, ALCOSAN shall (a) conduct an Industrial User survey and shall add to or delete from its approved pretreatment program all Industrial Users that have commenced or ceased to contribute industrial wastewater flows to the Regional Collection System within the prior year and (b) provide the Plaintiffs with annual updates of the information required pursuant to Paragraph 1 of this Appendix.

3. Within 240 days of the Date of Entry, ALCOSAN shall, for each Industrial User for which its industrial wastewater Discharges potentially reach waters of the United States untreated through a Combined Sewer Outfall or a Sanitary Sewer Outfall during wet weather, and for which storage of such industrial wastewater Discharge by the Industrial User is technically feasible, (a) revise that Industrial User's pretreatment permit to incorporate a requirement to store such industrial wastewater Discharge to the maximum extent possible during wet weather events and (b) notify the Industrial User of such pretreatment program revisions.

4. At least once during each Industrial User permit cycle, ALCOSAN shall inspect, during wet weather, the storage and other pretreatment facilities required to implement each Industrial User's pretreatment permit, including any additional storage or wet weather controls required pursuant to Paragraph 3 of this Appendix. During each such inspection, ALCOSAN shall also collect production information, control process parameters, and other data necessary to verify that the storage and wet weather controls are being implemented by the Industrial User and are effective in meeting each Industrial User's pretreatment permit requirements.

5. ALCOSAN shall promote the use of Storm Water best management practices and Storm Water pollution prevention programs by conducting outreach to entities served by Combined Sewer Systems that would be regulated under PADEP industrial Storm Water regulations if they were instead served by separate storm sewer systems. ALCOSAN shall develop and submit draft guidance designed to assist such entities in the implementation of such Storm Water best management practices and Storm Water pollution prevention plans. ALCOSAN shall submit such guidance to EPA and PADEP for review and approval, and to ACHD for review and comment, pursuant to Section VIII (Review and Approval of Submittals)

within six months from the Date of Entry, along with a list of entities targeted for this outreach effort. In the guidance, ALCOSAN shall address Storm Water best management practices, soil erosion prevention and sediment control, comprehensive site compliance evaluations, record keeping, employee training, and containment and diversion capabilities in areas where SARA Title III, Section 313 water priority chemicals are transferred, processed, handled, or stored. Within 45 days after approval by EPA and PADEP, ALCOSAN shall distribute the Storm Water guidance to all targeted entities.

Investigation and Elimination of PCB discharges

6. Within one year after the Date of Entry, ALCOSAN shall develop a plan for characterizing discharges, if any, of PCBs to the Conveyance and Treatment System. In its plan, ALCOSAN shall include provisions for:

a. collecting samples of wastewater within interceptors and wastewater influent at the Sewage Treatment Plant;

b. collecting samples of Combined Sewer Outfall Discharges as described in Appendix O (Combined Sewer Overflow Pollutant Monitoring);

c. analyzing the samples to determine the concentration of PCBs in each wastewater sample;

d. identifying, to the extent feasible, which portions of the Conveyance and Treatment System, if any, convey discharges of PCBs to the Sewage Treatment Plant;

e. identifying, to the extent feasible, which Customer Municipalities and Industrial Users, if any, route flow containing PCBs to the Conveyance and Treatment System; and

f. identifying, to the extent feasible, which trunk lines and/or Customer Municipality service areas, if any, convey discharges of PCBs to the Conveyance and Treatment System.

ALCOSAN shall submit its plan to EPA in accordance with Section VIII (Review and Approval of Submittals). Upon approval by EPA, ALCOSAN shall implement the plan in accordance with the schedule and requirements set forth therein.

APPENDIX G

Control of Solids and Floatables

1. Within 24 months after the Date of Entry, ALCOSAN shall submit to the Plaintiffs for review and approval, pursuant to Section VIII (Review and Approval of Submittals), an assessment of the types and amount of solid and floatable materials ("solids and floatables") entering the receiving waters, and an evaluation of the environmental and aesthetic impact of those solids and floatables upon those receiving waters, including the Sensitive Areas. In this assessment, ALCOSAN shall provide the following information:

   a. the measured annual volume of solids and floatables removed from wastewater by screening at the Sewage Treatment Plant during wet weather events;

   b. the estimated annual volume of solids and floatables discharged to each Sensitive Area and from each Combined Sewer Outfall identified in Appendix A; and

   c. the estimated annual volume of solids and floatables discharged to the Conveyance and Treatment System at each Point of Connection at which flow can be diverted to a Combined Sewer Outfall identified in Appendix A.

2. Within 120 days after the Plaintiffs' approval of ALCOSAN's submission of the information required pursuant to the preceding Paragraph, ALCOSAN shall submit to the Plaintiffs, in accordance with Section VIII (Review and Approval of Submittals), a plan to control solids and floatables ("Solids and Floatables Control Plan") which shall include the following information:

   a. an identification of the Combined Sewer Outfalls, with priority given to Combined Sewer Outfalls near the Sensitive Areas, at which ALCOSAN proposes to install solids and floatables control devices;

   b. a solids and floatables percent capture requirement for each Combined Sewer Outfall to receive such solids and floatables control devices;

c. a description of the proposed control device(s) to be installed at each Combined Sewer Outfall to receive such solids and floatables controls, as well as a description of procedures for installation, maintenance, and operation of the control devices identified; and

d. the projected percent capture of solids and floatables that reflects not only the control devices referenced in the preceding Subparagraph but also the control devices that ALCOSAN anticipates it will install and operate in accordance with the Wet Weather Plan required under this Consent Decree.

Within 24 months of the Plaintiffs' approval of ALCOSAN's proposed Solids and Floatables Control Plan, ALCOSAN shall commence operation of the approved control devices and methods, and shall achieve and maintain the percent capture requirements, in accordance with the requirements set forth in the approved plan.

3. Within 12 months after commencing operation of the control devices and methods in the approved Solids and Floatables Control Plan, ALCOSAN shall estimate, through the physical measurement of collected material, collection of control device operating parameters, and/or visual observation, the annual volume of solids and floatables captured during rain events.

4. Beginning 12 months after commencing operation of the control devices and methods in the approved Solids and Floatables Control Plan, ALCOSAN shall provide, on an annual basis, in the progress reports required pursuant to Section VII (Reporting and Recordkeeping) of the Consent Decree, the following information: (a) the volume of solids and floatables captured at the Sewage Treatment Plant, (b) the volume of solids and floatables captured by control devices, where the material must be removed manually, and (c) the estimated volume of solids and floatables reaching receiving waters based upon visual inspections of Outfalls within the Conveyance and Treatment System.

APPENDIX H

Elimination of Dry Weather Discharges

1. Within nine months after the Date of Entry, ALCOSAN shall submit to EPA and PADEP for review and approval, and to ACHD for review and comment, in accordance with Section VIII (Review and Approval of Submittals), a plan to eliminate all Dry Weather Discharges from the Combined Sewer Outfalls. ALCOSAN shall include the following in this "Dry Weather Discharge Elimination Plan:"

a. an identification of Regulators within the Conveyance and Treatment System that do not allow conveyance of the equivalent of 1.5 times the Peak Dry Weather Flow rate in accordance with the requirements of Appendix E (Regulator Capacity Evaluation and Modification);

b. for each such Regulator, a requirement that ALCOSAN shall modify, adjust or replace the Regulator in accordance with and subject to Appendix E (Regulator Capacity Evaluation and Modification);

c. provisions for monitoring Dry Weather Discharges from the Combined Sewer Outfalls in accordance with the monitoring program required under Appendix L (Combined Sewer Overflow and Sanitary Sewer Overflow Monitoring);

d. provisions for identifying each Dry Weather Discharge from the Combined Sewer Outfalls that may occur due to a blockage and the probable source of each blockage that caused or contributed to such Dry Weather Discharge within two days of discovering such Dry Weather Discharge;

e. descriptions of preventive maintenance (*e.g.* inspection, cleaning, application of enzymes) and/or source control measures (*e.g.* grease control equipment requirements) to be undertaken to minimize the future occurrence of such blockages; and

f. a provision providing that, in the event that the source of the blockage to the Conveyance and Treatment System is identified to be from a

Municipal Collection System, ALCOSAN shall provide notification of the blockage to each municipal source, to PADEP, and to ACHD within 24 hours so that corrective action can be implemented by the Municipality in accordance with applicable federal, state, and county laws, regulations and orders for correction.

Upon approval by EPA and PADEP, ALCOSAN shall implement the requirements of the Dry Weather Discharge Elimination Plan in accordance with the schedule and provisions set forth therein.

2. If, after two years of implementation of ALCOSAN's approved Dry Weather Discharge Elimination Plan, ALCOSAN has not eliminated Dry Weather Discharges from the Combined Sewer Outfalls, then ALCOSAN shall submit to EPA and PADEP for review and approval, and to ACHD for review and comment, in accordance with Section VIII (Review and Approval of Submittals), a revised Dry Weather Discharge Elimination Plan setting forth additional controls and measures that ALCOSAN proposes to undertake to eliminate all such remaining Dry Weather Discharges. ALCOSAN shall also request in writing from any Municipality contributing to such Dry Weather Discharges that the Municipality reduce Peak Dry Weather Flows entering the Conveyance and Treatment System in order to achieve a Peak Dry Weather Flow rate at the applicable Point of Connection that is at least 33% below the throughput capacity of the Regulator at the Point of Connection.

3. As set forth in Section VI, Subsection A (Compliance Requirements) and Subsection F (Operation and Maintenance of the Conveyance and Treatment System), ALCOSAN shall eliminate all Dry Weather Discharges from the Combined Sewer Outfalls by no later than six years after the Date of Entry.

APPENDIX I

Operation and Maintenance of the Conveyance and Treatment System

1. Within six months of the Date of Entry, ALCOSAN shall update its inventory of "Sewer System Components" in the Conveyance and Treatment System, excluding the Sewage Treatment Plant. For purposes of this Appendix, a "Sewer System Component" shall include: ALCOSAN Sewer Pipes; deep tunnel interceptors; river crossings; Pump Stations, and the Pump Station pumps, motors, bar screens, and sensors; Regulators; and except if a component of such a Regulator: valves, pipe segments, siphons, inflow prevention devices, manholes and other access structures. ALCOSAN shall use a computerized database for storing inventory information on the Sewer System Components, and such database shall include a record for each Sewer System Component containing the following information, where available:

a. the specific identification number;

b. the capacity of the component (*e.g.*, maximum flow rate);

c. the date of installation;

d. the location (address and state plane coordinates);

e. the inspection, maintenance, and repair history from January 1, 2003 to the present; and

f. the make and model and/or specifications.

ALCOSAN shall revise and update its inventory of Sewer System Components within 90 days of receiving new information regarding an existing Sewer System Component or placement in service of a new or modified Sewer System Component, including (a) any addition, removal, relocation, rehabilitation, or upgrade of an existing Sewer System Component, or (b) any new information obtained through the inspections required pursuant to Paragraph 3(c) of this Appendix and Appendix E (Regulator Capacity Evaluation and Modification).

Mapping

2. By December 31, 2008, ALCOSAN shall create a computerized map using geographic information system- ("GIS"-) based software that illustrates the configuration and physical attributes of the Conveyance and Treatment System, as well as the configuration and physical attributes of portions of the Regional Collection System that significantly impact the Conveyance and Treatment System.

a. In developing this map, ALCOSAN shall utilize the information provided to ALCOSAN by the Customer Municipalities pursuant to their respective Administrative Consent Orders or Consent Order and Agreements issued by ACHD or PADEP, respectively.

b. ALCOSAN shall include with the map overlays of the following components of the Regional Collection System: rain gauges; Industrial Users; known Outfalls; Sensitive Areas; results (either an average, complete listing or electronic cross-reference) from the receiving water quality monitoring activities undertaken pursuant to Appendix Q (Receiving Water Quality Monitoring) within the Conveyance and Treatment System; continuously flowing streams that are known to enter the Regional Collection System; and the Sewage Treatment Plant.

c. ALCOSAN shall provide this map and any overlays to any Customer Municipality, either in hard copy or electronically through a secure web site, consistent with Section VI, Subsection N (Coordination with Customer Municipalities).

System Inspections

3. Beginning within 90 days of the Date of Entry, ALCOSAN shall commence inspections of the Conveyance and Treatment System as follows:

a. Regulators and Inflow Prevention Devices - ALCOSAN shall inspect the Regulators associated with the Combined Sewer Outfalls and each inflow prevention device at least twice weekly and within 48 hours after every precipitation event sufficient to cause the wet well at the Sewage Treatment Plant to rise to an elevation of 690 feet national geodetic vertical datum ("NGVD"). If however, such a Regulator or inflow prevention device is temporarily inaccessible by land or boat, ALCOSAN shall inspect the Regulator and/or device as soon as possible after physical conditions allow such inspections and after river conditions allow safe navigation;

b. Pump Stations - ALCOSAN shall inspect each Conveyance and Treatment System Pump Station at least twice weekly and also once within 72 hours of every precipitation event sufficient to cause the wet well at the Sewage Treatment Plant to rise to an elevation of 690 feet NGVD;

c. External Inspection of ALCOSAN Sewer Pipes - By February 28, 2008 or 60 days after the Date of Entry, whichever is later, ALCOSAN shall conduct an external inspection of the visible ALCOSAN Sewer Pipes. As part of this inspection, ALCOSAN shall record, at a minimum, defects related to structural stability, defects that allow Inflow and/or Infiltration, evidence of excessive present or prior surcharging, evidence of present or prior Discharges, the locations from which Sanitary Sewer Overflows from the Conveyance and Treatment System and Combined Sewer Overflows occur, other visible hydraulic restrictions, and any other visible condition that compromises and/or diminishes the design capacity of the ALCOSAN Sewer Pipes. ALCOSAN may use previous inspection data to

satisfy the requirements of this Subparagraph if such inspection data were collected on or after January 1, 2001, and the following conditions are met:

i. The inspection indicated that the ALCOSAN Sewer Pipe had no defects causing a restriction in flow and conditions allowing excessive Infiltration or Inflow and/or significant root intrusions into the ALCOSAN Sewer Pipe;

ii. ALCOSAN provides to EPA, PADEP and ACHD the documentation for the inspection, which shall include a visual record of observations and a written summary of findings and conclusions; and

iii. There is no recent history of unaddressed basement backups along the sewer line segment (a contiguous manhole-to-manhole section of sewer pipe) in question.

d. Internal Inspection of ALCOSAN Sewer Pipes - By February 28, 2010, ALCOSAN shall internally inspect the ALCOSAN Sewer Pipes by using television, SONAR, or other widely accepted technology. As part of this inspection, ALCOSAN shall record, both in writing and by audio video, where feasible: all observable structural defects that may allow the entrance of Inflow and/or Infiltration into the ALCOSAN Sewer Pipes; all observable defects that significantly compromise and/or diminish the carrying capacity of the ALCOSAN Sewer Pipe; and all significant defects in siphons. ALCOSAN may use previous inspection data to satisfy the requirements of this Subparagraph if such inspection data were collected on or after January 1, 1997, and the following conditions are met:

i. The inspection indicated that the ALCOSAN Sewer Pipe had no defects causing a restriction in flow and conditions allowing excessive Inflow and/or Infiltration and/or significant root intrusions into the ALCOSAN Sewer Pipe;

ii. ALCOSAN provides to EPA, PADEP and ACHD the documentation for the inspection, which shall include a visual record of observations, a written summary and/or conclusions;

iii. There is no recent history of unaddressed basement backups along the sewer line segment (a contiguous manhole-to-manhole section of sewer pipe) in question; and

iv. ALCOSAN did not observe sediment accumulation or other obstruction of more than 25% of the pipe volume in any portion of that segment of the ALCOSAN Sewer Pipe.

Prior to the design of facilities necessary for the implementation of the approved Wet Weather Plan, ALCOSAN shall propose to the Plaintiffs a schedule for re-inspection, in accordance with Section VIII (Review and Approval of Submittals), of those portions of the ALCOSAN Sewer Pipes where such re-inspection is warranted based on the initial inspection.

e. Deep Tunnels and River Crossings - by February 28, 2010, ALCOSAN shall conduct an internal inspection of the entire length of the deep tunnel interceptors and river crossings for the Conveyance and Treatment System using closed circuit television, SONAR, and/or other widely accepted practices for the inspection of such systems; provided, however, that ALCOSAN need not conduct an internal inspection of those portions of the deep tunnel interceptors and river crossings where it demonstrates in

writing to the Plaintiffs that it is infeasible to conduct such an inspection. Also, ALCOSAN may use previous closed circuit television, sonar, and/or other such data for any segment of the deep tunnel interceptors and river crossings to meet the requirements of this Subparagraph if following conditions are met:

i. The inspection indicated that the deep tunnel interceptors and river crossings had no structural defects causing a restriction in flow and did not have conditions allowing excessive Inflow and/or Infiltration into the deep tunnel interceptors and river crossings;

ii. ALCOSAN provides to EPA, PADEP and ACHD the documentation of such prior inspection work, including a visual record of observations, a written summary, and conclusions;

iii. A prior inspection for which ALCOSAN collected such data between January 1, 1997 and January 1, 2004, indicates that there was then sediment accumulation of less than 30% of the diameter of that segment of the deep tunnel interceptors and/or river crossings; or

iv. A prior inspection for which ALCOSAN collected such data between January 1, 1997 and January 1, 2004, indicates that there was then sediment accumulation of between 30% and 50% of the diameter of that segment of the deep tunnel interceptors and/or river crossings, provided that ALCOSAN submits to the Plaintiffs for review and approval, and the Plaintiffs approve, a demonstration that such accumulation is not increasing over time

and that such accumulation will not restrict the capacity of the Conveyance and Treatment System; or

v. A prior inspection in which ALCOSAN collected such data after January 1, 2004, indicates that there was then sediment accumulation of less than 40% of the diameter of that segment of the deep tunnel interceptors and/or river crossings; or

vi. A prior inspection for which ALCOSAN collected such data after January 1, 2004, indicates that there was then sediment accumulation of between 30% and 50% of the diameter of that segment of the deep tunnel interceptors and/or river crossings, provided that ALCOSAN submits to the Plaintiffs for review and approval, and the Plaintiffs approve, a demonstration that such accumulation is not increasing over time and that such accumulation will not restrict the capacity of the Conveyance and Treatment System.

As part of this inspection, ALCOSAN shall record, both in writing and by audio video, where feasible, all observable defects that significantly compromise and/or diminish the carrying capacity of the deep tunnel interceptor or river crossing. Prior to the design of the facilities necessary for the implementation of the approved Wet Weather Plan, ALCOSAN shall propose to the Plaintiffs, in accordance with Section VIII (Review and Approval of Submittals), a schedule for re-inspection of those portions of the deep tunnel interceptors and river crossings where such re-inspection is warranted based upon the results of the initial inspection and prior inspection data, including consideration of the amount of observed

accumulated sediment and the observed condition of the system components.

f. Manholes and Access Shafts - Within two years from the Date of Entry, and at least every two years thereafter, ALCOSAN shall inspect each Conveyance and Treatment System manhole and other access shaft or structure. To the extent that each manhole can be located, ALCOSAN shall perform the inspection on both the interior and exposed exterior, and of each ALCOSAN Sewer Pipe connection into or exiting each ALCOSAN manhole. As part of these inspections, ALCOSAN shall record any defects related to structural stability, defects that allow Inflow and/or Infiltration, evidence of excessive present or prior surcharging, evidence of present or prior Discharges, the locations from which such Discharges occur, hydraulic restrictions, and any other condition that may compromise and/or diminish the future capacity of the ALCOSAN Sewer Pipes. The survey/inspection shall note all manholes that cannot be located, visually or with metal detectors, and areas where additional manholes need to be constructed. Previous physical survey data may be used to meet the requirements of this Paragraph if the work was completed on or after January 1, 1998, and if it meets the requirements of this Subparagraph.

g. Drop Shafts - Within 10 years from the Date of Entry, and at least every 10 years thereafter, ALCOSAN shall inspect the Conveyance and Treatment System drop shafts where the average daily Dry Weather Flow is less than 0.5 MGD using closed circuit television, SONAR, and/or other widely accepted practices for the inspection of such shafts.

Corrective Maintenance

4. Beginning within 90 days of the Date of Entry, ALCOSAN shall perform the following corrective maintenance for the Conveyance and Treatment System:

a. Shallow Cut Interceptors - Upon discovering accumulated sediment, debris, or other materials that restrict the hydraulic capacity within a shallow cut interceptor by greater than 25 percent, ALCOSAN shall clean and/or remove such material from that interceptor within 365 days.

b. Deep Tunnel Interceptors - Upon discovering accumulated sediment or debris that restrict the hydraulic capacity within a deep tunnel interceptor by greater than 50 percent, ALCOSAN shall, as technically feasible, clean and/or remove such material from that interceptor within 730 days.

c. Regulators and Inflow Prevention Devices - Upon discovering needed maintenance in a Regulator within the Conveyance and Treatment System or inflow prevention device, ALCOSAN shall initiate corrective measures or maintenance within 24 hours and complete such corrective measures or maintenance as expeditiously as possibly but by no later than 60 days after such discovery.

d. Manholes and Access Shafts - ALCOSAN shall complete the necessary repair of all manholes and access shafts as expeditiously as possible, but no later than nine months of discovering the need for such repairs.

e. Pump Stations - Upon determining that corrective maintenance of a Conveyance and Treatment System Pump Station is required, ALCOSAN shall initiate such corrective maintenance within 24 hours and complete such corrective maintenance as expeditiously as possible but by no later than 90 days after such determination.

f. ALCOSAN Sewer Pipes - ALCOSAN shall initiate the repairs of all significant structural defects in the ALCOSAN Sewer Pipes such as sewer lines with collapsed sections, sections with crown and/or invert missing, dirt pipe (missing pipe), void in backfill, and any other defect that an overseeing professional engineer determines to need immediate attention, within 60 days of the discovery of such defects. ALCOSAN shall complete the repairs to significant structural defects within six months of discovery; provided, however, that if ALCOSAN establishes that it is not feasible for ALCOSAN to repair the defect or condition within these timeframes, then ALCOSAN shall, within 15 days of discovery of the defect or condition, notify EPA, PADEP, and ACHD, in writing and provide a plan and the most practicable schedule for repair or remedial action of the defect or condition for EPA and PADEP review and approval.

g. ALCOSAN Sewer Pipe Blockages - ALCOSAN shall repair any defect or rectify any condition in the ALCOSAN Sewer Pipes that cause a complete Sewage flow blockage resulting in a Combined Sewer Overflow or Sanitary Sewer Overflow, basement flooding or public health nuisance within 30 days of discovery of such defect or condition; provided however, that if ALCOSAN establishes that it is not feasible for ALCOSAN to repair such ALCOSAN Sewer Pipe defect or condition within these timeframes, then ALCOSAN shall, within 15 days of discovery of the defect or condition, notify EPA, PADEP, and ACHD, in writing and provide a plan and the most practicable schedule for repair or

remedial action of the defect or condition for EPA and PADEP review and approval.

i. ALCOSAN shall use best efforts to commence pumping and/or capture of any Discharge that occurs as a result of conditions described in this Subparagraph within 24 hours after ALCOSAN becomes aware of the Discharge.

ii. If, however, commencement of pumping and/or capture of any such Discharge cannot occur within 48 hours of ALCOSAN becoming aware of the Discharge, then ALCOSAN shall request from EPA, PADEP, and ACHD, in writing, within such 48 hours, an extension of time and shall include in the request a detailed explanation of the actions to be taken to expedite the commencement of pumping and/or capture.

h. Corrective Maintenance Based on Overflow Response Plan - ALCOSAN shall also undertake all actions necessary to comply with the requirements and schedule in its approved Overflow Response Plan, as referenced in Section VI, Subsection P (Overflow Response) of this Consent Decree.

Additional Corrective Maintenance

5. ALCOSAN may identify and implement corrective maintenance activities in addition to, or, with the concurrence of the Plaintiffs, in alternative to the activities required in the preceding Paragraph, for the proper operation of the Conveyance and Treatment System.

Preventive Maintenance

6. ALCOSAN shall implement a preventive maintenance program for the Conveyance and Treatment System to provide for the proper operation and maintenance of equipment while

minimizing failures, malfunctions, and line blockage due to the lack of adequate preventive care. Beginning on the Date of Entry, ALCOSAN shall:

a. perform preventive maintenance at each Pump Station in the Conveyance and Treatment System in accordance with procedures and schedules established by ALCOSAN and the manufacturer's recommendations for the Pump Station equipment;

b. seal (where appropriate) and maintain manholes to prevent and/or reduce Infiltration;

c. implement a grease control program that, at a minimum, (i) maps identified grease blockages, (ii) notifies pretreatment staff of recurring grease blockages, (iii) requests the installation of grease traps and/or the implementation of a trap cleaning and inspection program and provides notice to ACHD of the request, and (iv) includes scheduled inspection of known problem areas;

d. implement a root control program to inspect the ALCOSAN Sewer Pipes and remove roots from such pipes;

e. commence the identification of all known locations where ALCOSAN does not have ready physical and legal access to any portion of the Conveyance and Treatment System, the reasons for the lack of access, and ALCOSAN's proposed strategy for obtaining and maintaining access to such location to perform the corrective and preventative maintenance required by this Appendix, which identification shall be completed within six months from the Date of Entry.

f. draw down the wet well during dry weather to remove accumulations of debris from the deep tunnel interceptors and to clean grease deposits from deep tunnel access shafts and float wells as follows:

i. ALCOSAN shall, as technically feasible, draw down the wet well for four to six continuous hours to allow for removing accumulations of debris from the deep tunnels at least twice per week in the Summer season, and in other seasons, during each period of dry weather sufficient to allow draw downs for four to six continuous hours; and

ii. ALCOSAN shall clean, as necessary, based on the inspections performed pursuant to Subparagraph 3(f) of this Appendix, the following access shafts in the Conveyance and Treatment System, unless an access shaft is prone to grease accumulation, in which case ALCOSAN shall inspect and clean it twice a year: A-54 Mendota Street; A-24 36th Street; M-09 South 8th Street; M-30 Four Mile Run; M-41 Glenwood; M-46 Nine Mile Run; M-59 11th Street; O-07 Chartiers-Ohio Junction; and O-42 Belmont Street;

g. document all complaints, inspections, work orders, maintenance, and replacements of Sewer System Components, consistent with the requirements in Paragraph 1 (System Inventory) of this Appendix, maintain these records for a period of five years, and make these records available to EPA and/or PADEP upon request;

h. use and, as necessary, enhance a computerized maintenance tracking system: (i) to establish and track preventive maintenance standard operating procedures and schedules; (ii) to store preventive maintenance

schedules and maintenance activity history, including completed tasks; and (iii) to automatically issuing work orders for preventive maintenance in accordance with established schedules;

i. perform cleaning and other preventive maintenance at each Combined Sewer Outfall, Regulator within the Conveyance and Treatment System, and inflow prevention device at least three times per year;

j. clean and flush the Conveyance and Treatment System Z–structure connector lines at least three times per year;

k. inspect and as necessary clean at least twice per year ALCOSAN Sewer Pipes with known problems of excessive sediment and grit accumulation;

l. inspect and, as necessary based on the inspection, clean inverted siphons at least once every four years;

m. establish procedures to be followed in the event of discovering various types of emergencies that might be encountered in the operation of the Conveyance and Treatment System, including corrective actions, appropriate notifications to the public or other affected parties, and the use of emergency equipment, and available personnel; and

n. train staff to perform proper operation and maintenance of the Conveyance and Treatment System, in accordance with all federal, state, and local requirements for training and/or certification of such persons.

Operation and Maintenance Manuals and Other Documentation

7. Within six months of the Date of Entry, ALCOSAN shall update and consolidate its existing operation and maintenance manuals for the Conveyance and Treatment System ("O&M Plan") to reflect the requirements of this Appendix. ALCOSAN shall ensure that the revised manuals include, at a minimum, the following information:

a. an identification of the various Conveyance and Treatment System components requiring routine inspection and maintenance, as well as the types of maintenance activities applicable to each component;

b. a schedule for the systematic inspection of all Sewer System Components;

c. a description of the chain of responsibility within ALCOSAN for operation of the Conveyance and Treatment System, and the names and contact information of those responsible for its operation and maintenance;

d. sample forms for documenting inspection and maintenance activities; and

e. a description of training required for staff that operate and/or maintain the Conveyance and Treatment System in accordance with the training procedures developed pursuant to this Appendix.

ALCOSAN shall maintain copies of all O&M Plans at the Sewage Treatment Plant and wherever else ALCOSAN deems appropriate.

Operation and Maintenance Documentation and Databases

8. Beginning 120 days after the Date of Entry, ALCOSAN shall keep at the Sewage Treatment Plant, and provide to the Plaintiffs upon request, the following additional documentation of its operation and maintenance program for the Conveyance and Treatment System:

a. all operation and maintenance manuals, with Pump Station operation and maintenance manuals kept at both the Sewage Treatment Plant and at each respective Pump Station;

b. a set of maps, prepared in accordance with Paragraph 2 of this Appendix, which ALCOSAN shall make available to its work crews;

c. a description of the resources (equipment, spare parts, manpower, and training) necessary for operation and maintenance of the Conveyance and Treatment System;

d. an organizational chart illustrating the chain of responsibility for operation and maintenance of the Conveyance and Treatment System, including the administrative positions responsible for such activities;

e. a description of procedures for documenting operation, inspection, and maintenance activities, and for retaining such documentation in hard copy or electronically in ALCOSAN's database;

f. a description of procedures for reviewing and revising the operation and maintenance procedures and corresponding operation and maintenance manuals; and

g. all requests and authorizations for expenditures for maintenance for the Conveyance and Treatment System generated within the last five years;

9. ALCOSAN shall, within 90 days after developing the inspection and maintenance forms required pursuant to Subparagraph 7(d), above, either place the forms on ALCOSAN's secure web site or provide a copy of such forms to each Customer Municipality for their possible use in municipal inspection and maintenance programs.

10. Beginning 90 days after the Date of Entry, ALCOSAN shall include all documented operation and maintenance information about the Conveyance and Treatment System in a computerized operations and maintenance management and database program. Such operations and maintenance management program and database shall include all of the information referenced in Paragraph 8 of this Appendix, as well as the following information:

a. the system inventory information described in Paragraph 1 of this Appendix;

b. schematic diagrams (if available) of the inventoried components;

c. maintenance schedule and pending work orders; and

d. operation and maintenance procedures and forms for the various components.

Wasteload Management Reports

11. ALCOSAN shall provide to PADEP in its Annual Wasteload Management Report, a summary of sewer inspection activities that ALCOSAN conducts for the Conveyance and Treatment System. ALCOSAN shall also make a copy of its Annual Wasteload Management Report available on ALCOSAN's secure web site to each Customer Municipality within 30 days of its submission to PADEP.

APPENDIX J

Supplemental Environmental Projects

Pursuant to Section XI (Supplemental Environmental Projects), ALCOSAN shall submit to EPA and PADEP a proposal to perform stream restoration activities at one or more of the following locations:

a. Woods Run Valley (near Combined Sewer Outfall O-27);

b. Pine Hollow (near Combined Sewer Outfall C-09);

c. Panther Hollow / Four Mile Run (near Combined Sewer Outfall M-29);

d. Spring Garden (near Combined Sewer Outfall A-60);

e. Freid & Reineman (near Combined Sewer Outfall A-66);

f. Orr St.;

g. Tassey Hollow;

h. Carnegie Park;

i. Sharpsburg (same as Ravine Street);

j. Delafield Ave. (Fox Chapel, O'Hara and Sharpsburg); and/or

k. Sheraden Park

APPENDIX K

Public Notification and Outreach

1. Within 12 months from the Date of Entry, ALCOSAN shall post a sign adjacent to each of the Combined Sewer Outfalls identified in Appendix A, and shall include the following language on each sign:

> "These waters receive sewage from sewer overflows as a result of rain, snowmelt, and other events. Please limit contact with these waters at these times. For more information please call ALCOSAN at (phone # to be provided). Please report the observation of any discharge occurring during dry weather to that number."

The sign shall (a) be in compliance with applicable local ordinances; (b) be legible from a distance of at least 15 feet; (c) be positioned so that its lettering is visible from the adjacent waterway; and (d) where the public accesses the area around the Combined Sewer Outfall (as evidenced by informal walking paths, swimming areas, etc.), have identical lettering on both sides so that it can be seen from the land side of the sign as well. Posted signs that meet requirements of the administrative orders or agreements issued by PADEP to the Customer Municipalities shall be considered acceptable to meet the requirements of this Paragraph. ALCOSAN shall provide a sample of such sign to EPA, PADEP, and ACHD for review and approval prior to posting.

2. Within 12 months from the Date of Entry, ALCOSAN shall post a sign adjacent to each of the Sanitary Sewer Outfalls identified in Appendix B and shall include the following language on each sign:

> "These waters receive sewage from sewer overflows as a result of rain, snowmelt, and other events. Please limit contact with these waters at this time. Discharges to receiving waters from this structure, identified as [insert structure ID], are prohibited by law. Please report the observation of such discharges by calling ALCOSAN at (_phone # to be provided)."

The sign shall (a) be in compliance with applicable local ordinances; (b) be legible from a distance of at least 15 feet; (c) be positioned so that its lettering is visible from the adjacent waterway; and (d) where the public accesses the area around the Sanitary Sewer Outfall (as

evidenced by informal walking paths, swimming areas, etc.), have identical lettering on both sides so that it can be seen from the land side of the sign as well. ALCOSAN shall provide a sample of such sign to EPA, PADEP, and ACHD for review and approval prior to posting.

3. Beginning within six months of the Date of Entry, ALCOSAN shall establish and update on a quarterly basis on its publicly-accessible web site the following information:

a. a map identifying the different sewersheds;

b. maps of all Sanitary Sewer Outfalls and all Combined Sewer Outfalls in the Conveyance and Treatment System and Outfalls in the Regional Collection System reported by Customer Municipalities;

c. a map of all locations where there are public advisory notices, such as warning flags and/or signs;

d. a map of all continuous flowing streams and rivers within the sewersheds, identified by known, existing use and highlighted when listed as impaired by PADEP pursuant to Section 303 of the Clean Water Act and all streams and rivers with Combined Sewer Outfalls and/or Sanitary Sewer Outfalls;

e. a map of major recreational areas;

f. a record of the number of public advisories, on a seasonal basis, for the most recent three years, beginning with the Date of Entry, known to ALCOSAN, issued as a result of Discharges from the Conveyance and Treatment System, or a link to the ACHD Internet site containing such information;

g. data for each location monitored pursuant to Appendix Q (Receiving Water Quality Monitoring), showing fecal coliform levels within the last 24 months for the Sensitive Areas;

h. a description of ALCOSAN's methods for notifying the public of the impacts of Discharges on receiving waters, including use of the signs required by Paragraphs 1 and 2 of this Appendix and notices issued by ALCOSAN to ACHD, marinas, and other organizations, and a description

of the flag system for notification used by marinas to alert the public of such Discharges; and

i. contact information for reporting Dry Weather Discharges from the Conveyance and Treatment System and Sanitary Sewer Overflows from the Conveyance and Treatment System, and solids and floatables accumulation. ALCOSAN shall update this information on its publicly-accessible web site within 30 days after the last day of each calendar quarter.

4. ALCOSAN shall make available the ACHD River Water Advisory Hotline number, an explanation of ACHD's River Water Advisory Program, and the address of the web site required by Paragraph 3, above, to participants at boat shows held in Pittsburgh.

5. Following the Date of Entry, ALCOSAN shall conduct regional municipal meetings in coordination with local government authorities, 3 Rivers Wet Weather Demonstration Program ("3RWWDP"), or other appropriate organizations at least three times annually. At such meetings, ALCOSAN shall communicate the status of activities associated with the Consent Decree.

6. Commencing on the Date of Entry, ALCOSAN shall participate in the River Water Advisory Program initiated by ALCOSAN and operated by ACHD, and shall provide to ACHD the information necessary to maintain ACHD's River Water Advisory Program, including its 24-hour Hotline.

7. ALCOSAN shall make available Combined Sewer Overflow Fact Sheet Bulletins through its Public Relations Office.

APPENDIX L

Combined Sewer Overflow and Sanitary Sewer Overflow Monitoring

1. Within 180 days of the Date of Entry, ALCOSAN shall commence implementation of a program for monitoring each Discharge from the Conveyance and Treatment System. At a minimum, ALCOSAN shall:

a. identify and document the (i) location, (ii) cause, (iii) duration, (iv) date, and (v) volume, of each Discharge from the Conveyance and Treatment System, as well as (vi) any corrective action taken for each such Discharge. ALCOSAN shall obtain this information from the inspection program required pursuant to Appendix I (Operation and Maintenance of the Conveyance and Treatment System), the depth of flow monitoring devices (using depth measurement and a hydraulic rating curve) and notification devices required pursuant to Subparagraphs 1(b) and (c) of this Appendix, and other sources. ALCOSAN shall supplement this information with estimated Discharge frequencies and volumes based upon application of the model required pursuant to Appendix P (Hydrologic and Hydraulic Model).

b. install, calibrate, and operate the depth of flow monitoring devices (using depth measurement and a hydraulic rating curve) and notification devices at or in the vicinity of the Regulators associated with the following Combined Sewer Outfalls: M-47; M-37; A-35; C-05; C-07; C-25; M15z; M-42; O-39; and T-16. ALCOSAN shall submit to the Plaintiffs for review and approval an annual update to this list of Combined Sewer Outfalls. ALCOSAN shall maintain and operate such devices prior to its Validation of the model required pursuant to Appendix P (Hydrologic and Hydraulic Model).

c. install, calibrate, and operate depth of flow monitoring devices (using depth measurement and a hydraulic rating curve) and notification devices, as and where feasible, at or in the vicinity of the Regulators associated with the Sanitary Sewer

Outfalls listed in Appendix B (Sanitary Sewer Outfalls). ALCOSAN shall maintain and operate such devices prior to Validation of the model required pursuant to Appendix P (Hydrologic and Hydraulic Model). ALCOSAN shall continue to maintain and operate the depth of flow monitoring devices for 12 months after Validation of the model required pursuant to Appendix P (Hydrologic and Hydraulic Model), and shall continue to maintain and operate the notification devices until Sanitary Sewer Overflows from the Sanitary Sewer Outfalls are eliminated.

d. on a monthly basis, enter the parameters in Subparagraph (a), above, into a computerized database.

e. determine, for each Combined Sewer Overflow, whether or not the Discharge was caused by precipitation alone (*i.e.,* whether such Combined Sewer Overflow is a Wet Weather Discharge).

2. On a semi-annual basis, ALCOSAN shall also analyze Discharge occurrence data for the Conveyance and Treatment System and develop trends to determine if the occurrence and/or total volume of such Discharges are declining. ALCOSAN shall make this determination for each Outfall within the Conveyance and Treatment System and over all Outfalls within the Conveyance and Treatment System, for each of the following types of Discharges:

a. Combined Sewer Overflows caused by equipment failures;

b. Sanitary Sewer Overflows from the Conveyance and Treatment System; and

c. Discharges from the Conveyance and Treatment System that are exempted from the definition of Dry Weather Discharges and occur during dry weather; and

d. Dry Weather Discharges from the Conveyance and Treatment System that are the result of insufficient capacity in the Conveyance and Treatment System.

3. On an annual basis, ALCOSAN shall evaluate the efficacy of the measures implemented under its Revised Nine Minimum Control Plan, as well as other measures required pursuant to this Consent Decree, in reducing the impacts of Combined Sewer Overflows on receiving waters.

4. ALCOSAN shall provide to the Plaintiffs the information required by the preceding Subparagraphs within 90 days of a request from one or more of the Plaintiffs.

5. ALCOSAN shall perform all overflow monitoring required under this Appendix in accordance with the procedures set forth in Appendix M (Flow Monitoring), as applicable.

APPENDIX M

Flow Monitoring

Flow Monitoring Plan

1. a. ALCOSAN shall, within 30 days from the Date of Entry, submit to the Plaintiffs for review and approval in accordance with Section VIII (Review and Approval of Submittals) a flow monitoring plan for the Regional Collection System ("RCS Flow Monitoring Plan"), consistent with the requirements of this Consent Decree and this Appendix M, to enable ALCOSAN to develop its Wet Weather Plan and to enable ALCOSAN to conduct flow monitoring in the Participating Municipalities sufficient for the Participating Municipalities to complete the feasibility studies required by the Administrative Consent Orders first issued by ACHD and the Consent Orders and Agreements first issued by PADEP to the Participating Municipalities in or about October 2003 regarding Phase 1 Assessments of sewer systems, wet weather obligations and long term control plan responsibilities, and any subsequent orders and/or agreements issued to the Participating Municipalities containing identical or substantially similar obligations.

b. In preparing the RCS Flow Monitoring Plan, ALCOSAN shall utilize the draft "Regional Flow Monitoring Plan," dated June 1, 2006, submitted on behalf of the Participating Municipalities, and a February 5, 2007 letter from the 3 Rivers Wet Weather Demonstration project to DEP and ACHD regarding the draft Regional Flow Monitoring Plan (collectively, the "Draft Plan") to allow it to effectively monitor and quantify average daily Dry Weather Flows, peak Dry Weather Flows and peak Wet Weather flows within the Regional Collection System. The Plaintiffs shall utilize the Draft Plan in their review of ALCOSAN's proposed RCS Flow Monitoring Plan.

c. In its submission of the RCS Flow Monitoring Plan ALCOSAN shall include provisions for the inspection of 524 proposed flow meter locations, as set forth in the February 5, 2007 Revised Table 3-7 of the Draft Plan, and for the inspection of 13 Pump Station Overflow Meter locations, as set forth in Table M-1 of this Appendix. If upon inspection of such a proposed flow meter location, such location is physically feasible and technically suitable for the installation and operation of a flow meter, ALCOSAN shall utilize such location and install and operate the appropriate type of flow meter as defined in Table M-2, subject to proposals by ALCOSAN in the RCS Flow Monitoring Plan to: (i) reduce the number of flow meters based on past flow monitoring efforts by or on behalf of only ALCOSAN (excluding any prior flow monitoring efforts by Municipalities), that meet the requirements of Paragraph 36 of this Consent Decree and (ii) change the location to more effectively and efficiently collect flow monitoring data. Notwithstanding any provision of this Appendix M and this Consent Decree to the contrary, ALCOSAN shall receive credit for past flow monitoring for the 19 meters listed in Table M-3 provided the data meet the requirements of Paragraph 36 of this Consent Decree.

d. For purposes of this Appendix, ALCOSAN shall refer to the following meters listed in Table M-2, collectively, as "ALCOSAN Flow Meters:" ALCOSAN Point of Connection Meters; CSO/SSO Structure Meters; and Pump Station Overflow Meters.

e. For purposes of this Appendix, ALCOSAN shall refer to the following meters listed in Table M-2, collectively as "Municipal Flow Meters:" Multi-Municipal Conveyance Sewer Meters; Internal Municipal Overflow Meters; Municipal Boundary Meters; and Internal Municipal Sub-Area Meters.

2. ALCOSAN shall utilize the approved RCS Flow Monitoring Plan to, among other things:

a. measure flow rates at ALCOSAN Point of Connection Meter locations, as and where feasible, as close in proximity as possible to each Point of Connection (unless

ALCOSAN demonstrates in writing, that it is not feasible to monitor flow at or near a given Point of Connection), prior to any diversion structure that allows relief of excess flow at the Point of Connection. Where it is not feasible to conduct such flow monitoring, or to obtain actual flow monitoring data, ALCOSAN shall utilize other methodologies to characterize flow rates for such Point of Connection;

b. provide for the ALCOSAN Point of Connection Meters, an estimate of the population of the area that is tributary to each Point of Connection at the time the plan is submitted;

c. determine, in gallons per day per inch mile of sewer (or, if it is not possible to determine the flow in these terms, in gallons per day) the contribution of flow to the Conveyance and Treatment System from each Point of Connection;

d. Validate the model used to determine the frequency and volume of Combined Sewer Overflows and Sanitary Sewer Overflows to receiving waters in accordance with Appendix L (Combined Sewer Overflow and Sanitary Sewer Overflow Monitoring) and Appendix P (Hydrologic and Hydraulic Model);

e. provide sufficient data to enable ALCOSAN to characterize flows for the Hydrologic and Hydraulic Model required by this Consent Decree;

f. provide accurate and reliable data for joint use by ALCOSAN and the Customer Municipalities in developing a wet weather plan with a range of remedial control measures; and

g. obtain accurate and reliable data to develop and Validate the Hydrologic and Hydraulic Model required pursuant to the Consent Decree and Appendix P (Hydrologic and Hydraulic Model), using a flow monitoring network that provides representative, accurate, and reliable data with sufficient spatial and temporal coverage.

3. ALCOSAN shall include in the RCS Flow Monitoring Plan:

a. a list of locations, consistent with the provisions of Subparagraph 1.c. of this Appendix, for the installation of flow meters to measure average daily Dry Weather Flows, peak Dry Weather Flows, and peak Wet Weather Flows for each monitored rainfall event, and to Validate the Hydrologic and Hydraulic Model used to quantify and characterize the total overflow volumes during each rainfall event, with readings taken in 15-minute intervals;

b. provisions for commencing flow monitoring of ALCOSAN Point of Connection Meters, SSO Structure Meters, Pump Station Over Flow Meters, Long-Term Municipal Boundary Meters, Multi-Municipal Conveyance Sewer Meters, and Long-Term Internal Municipal Sub-Area Meters by February 1, 2008, or within 90 days after receiving Plaintiffs' written approval of the RCS Flow Monitoring Plan, whichever date is later, for a minimum duration of one year during which (i) total annual precipitation volume is no less than 30.9 inches (water equivalent) and (ii) at least two specific rainfall events occur, excluding snow melt, equal to or exceeding one inch of rainfall in a 24 hour period; provided, however, that if during that one year period two such events do not occur, or if the total annual precipitation volume does not equal or exceed 30.9 inches (water equivalent), monitoring shall be extended for an additional nine months or until such conditions are met, whichever occurs first; the conditions that must be met before ALCOSAN can cease the extended monitoring are (A) two specific rainfall events, excluding snow melt, equal to or exceeding one inch of rainfall in a 24-hour period that occur anytime from the commencement of flow monitoring and (B) a total annual precipitation of at least 30.9 inches (water equivalent) as measured during any 12 calendar months from the commencement of flow monitoring until it ceases. Provided further, that in no event shall ALCOSAN be required to monitor for more than a total of 21 months under this Paragraph;

c. provisions for commencing flow monitoring of Municipal CSO Structure Meters by March 15, 2008, or within 135 days after receiving the Plaintiffs' written approval of

the RCS Flow Monitoring Plan, whichever date is later, for a minimum duration of six months during which period the total rainfall volume is no less than 15.5 inches and at least one specific rainfall event occurs, excluding snow melt, equal to or exceeding one inch of rainfall in a 24-hour period; provided, however, that if, during that six month period, these conditions are not met, monitoring shall be extended for an additional three months or until such conditions are met, whichever occurs first; the events that must occur before ALCOSAN can cease the extended monitoring are (i) at least one specific rainfall event, excluding snow melt, equal to or exceeding one inch of rainfall in a 24-hour period that occurs anytime from the commencement of flow monitoring, and (ii) a total rainfall volume no less than 15.5 inches as measured from the commencement of flow monitoring. Provided further that in no event shall ALCOSAN be required to monitor for longer than a total of nine months under this Paragraph;

d. provisions for commencing flow monitoring of Short-Term Internal Municipal Sub-Area Meters, Short-Term Municipal Boundary Meters and Internal Municipal Overflow Meters by March 15, 2008, or within 135 days after receiving Plaintiffs' written approval of the RCS Flow Monitoring Plan, whichever date is later, for a minimum duration of three months during which period the total rainfall volume is no less than 7.50 inches and at least ten specific rainfall events equal to or exceeding 0.20 inches of rainfall in a 24-hour period, occur; provided, however, that if, during that three month period, these conditions are not met, monitoring shall be extended for an additional three months or until such conditions are met, whichever occurs first; the conditions that must be met before ALCOSAN can cease the extended three month monitoring period are (i) ten specific rainfall events, excluding snow melt, equal to or exceeding 0.20 inches of rainfall that occur anytime from the commencement of flow monitoring and (ii) a total rainfall volume no less than 7.50 inches as measured from the commencement of flow monitoring. Provided further that in no event shall ALCOSAN be required to monitor longer than a total of six months under this Paragraph;

e. provisions for monitoring at the Points of Connection, except to the extent ALCOSAN asserts that it is infeasible to monitor flow at a given Point of Connection to provide accurate and reliable data, ALCOSAN shall include in its RCS Flow Monitoring Plan a proposal to Plaintiffs for either monitoring as close as possible to a given Point of Connection or otherwise ascertaining how the flow monitoring data will be accurately determined or estimated;

f. provisions for dimensioned sketches, profile selections and plan views of each monitoring manhole, the configurations of flow monitoring equipment to be installed, and sewer GIS maps illustrating the flow monitoring location, the adjacent upstream and downstream manholes and connection pipes and the Outfall, if any;

g. provisions for inspecting, maintaining, and calibrating the flow meters;

h. a quality assurance and quality control plan to ensure that the flow monitoring network provides representative, accurate, and reliable data, and provides sufficient quality for use in the development and Validation of the Hydrologic and Hydraulic Model required under the Consent Decree.

i. provisions for coordinating flow monitoring activities so that flows are measured with meters that are capable of comparable accuracy and are similarly calibrated;

j. in accordance with the schedule set forth in Appendix X (Reporting Schedule), provisions for reporting to EPA, PADEP, and ACHD, all flow monitoring data for the ALCOSAN Point of Connection Meters;

k. provisions for sharing with the Participating Municipalities all raw flow monitoring data from the Municipal Flow Meters, CSO/SSO Structure Meters and Municipal Pump Station Overflow Meters on a monthly basis;

l. provisions for sharing with the Participating Municipalities quality reviewed flow monitoring data from the ALCOSAN Point of Connection Meters on a bi-monthly

basis, and from the CSO/SSO Structure Meters and ALCOSAN Pump Station Meters on a quarterly basis;

m. provisions for developing a GIS map showing the location of all proposed flow monitoring sites;

n. provisions for delineating the boundaries of the tributary sewershed area for each flow meter;

o. a description of the flow monitoring technique(s) to be employed;

p. provisions for identifying the flow monitoring technology to be used at each location, and for ensuring that the flow monitoring will be performed in accordance with manufacturer's specifications for the monitoring equipment utilized;

q. provisions for describing the methods to be used in approximating overflow volume, frequency and duration, where it is not feasible to obtain accurate and reliable flow monitoring data;

r provisions for ensuring that ALCOSAN's flow monitoring crew is properly trained in conducting flow monitoring;

s. provisions for conducting field investigations of its flow monitoring sites to (i) ensure that designated monitoring sites can provide representative, accurate, and reliable data, (ii) ensure that monitoring sites conform with the provisions of its approved RCS Flow Monitoring Plan and (iii) verify that hydraulic, site access, safety, and maintenance conditions are suitable for successful flow monitoring;

t. provisions for using redundant level sensors, where feasible, at each CSO/SSO Structure Meter; and, where such redundancy is feasible, using different technologies where feasible; and,

u. provisions for monitoring the flow at the Municipal Pump Stations listed in Table M-1 by either (i) monitoring all flows going into each Municipal Pump Station or (ii) monitoring the Discharge at each Municipal Pump Station.

Implementation of Approved Flow Monitoring Plan

4. On February 1, 2008 or within 90 days after receiving Plaintiffs' written approval of the RCS Flow Monitoring Plan, whichever date is later, ALCOSAN shall commence implementation of the approved RCS Flow Monitoring Plan in accordance with the requirements and schedule set forth therein.

5. ALCOSAN shall employ the services of a Professional Engineer to oversee its flow monitoring program and certify the accuracy of all flow monitoring data. Other flow monitoring performed by ALCOSAN or by a third party may be acceptable as long as it meets the standards set forth in this Appendix.

6. In conducting flow monitoring field investigations under the approved RCS Flow Monitoring Plan, ALCOSAN shall record flow regime conditions such as surface turbulence and backwater interference from downstream pipes and structures and document observed site conditions using standardized forms. If the field investigation reveals that the selected site or alternate site, if any, is not suitable for successful flow monitoring, ALCOSAN shall utilize other established methodologies to characterize the flow rate for such flow monitoring site.

7. ALCOSAN shall record flow monitoring site set-up information, including measured sensor offsets, site name, manhole number, pipe size, meter number, pre-installation calibration information providing the initial calibration and calibrator's name, dates of calibration and installation, and an explanation of any variance from manufacturer-recommended procedures. ALCOSAN shall maintain such records and shall provide such records to EPA, PADEP, ACHD, and the Customer Municipalities upon request.

8. ALCOSAN shall interrogate the meter at each flow monitoring point every five business days following the start of monitoring until the equipment is performing properly, unless such interrogation is infeasible at a particular time, in which case ALCOSAN shall interrogate the meter in question as soon thereafter as feasible. Thereafter, interrogation shall be performed as appropriate to the approach employed and in accordance with the RCS Flow Monitoring Plan, but in no event less than every other week, unless such interrogation is infeasible at a particular time. ALCOSAN shall also physically inspect the flow meters every time the meters are interrogated. ALCOSAN shall also assess the monitoring results on a monthly basis thereafter, and shall document the findings of each evaluation in the progress reports required pursuant to Paragraph 94 of Section VII (Reporting and Recordkeeping).

9. ALCOSAN shall perform bench and field calibration of flow monitoring devices in accordance with the manufacturer's instructions and the data quality assurance and control provisions of its approved RCS Flow Monitoring Plan. ALCOSAN shall document calibration measurements and adjustments and record dates and times that such measurements are made on field sheets.

10. If any monitoring device is moved, or if there are any other substantive changes to meter installations or adherence to ALCOSAN's data quality assurance and control provisions of its approved RCS Flow Monitoring Plan, ALCOSAN shall notify Plaintiffs of such change within 30 days of such occurrence, and within 45 days of such occurrence ALCOSAN shall submit a proposed amendment to the RCS Flow Monitoring Plan to Plaintiffs, in accordance with Section VIII (Review and Approval of Submittals).

11. ALCOSAN shall program the memory modules for obtaining and storing readings at 15-minute intervals at the quarter hour (e.g. 2:00, 2:15, or 2:30 and not 2:03, 2:18, or 2:33). To match flow data with rainfall data, ALCOSAN shall ensure that the clocks in all of the meters

are synchronized and that no data are lost by checking the manufacturer's manual to determine the maximum period of record before new data wraps over previous memory module data.

12. ALCOSAN shall calculate and record flows in million gallons per day (MGD), or gallons per day (GPD), as appropriate, and not cubic feet per second (CFS), and shall report data to three significant figures. ALCOSAN shall record levels in inches and velocity in feet per second.

13. Except when access is infeasible, ALCOSAN shall measure depth of flow and obtain other field measurements such as depth and/or velocity readings, as appropriate, whenever data interrogation is conducted and recorded to verify that the equipment is properly calibrated and providing reliable results. ALCOSAN shall schedule data interrogations at differing times of day and weather conditions to obtain field data points over a wide range of flow depths. ALCOSAN shall employ appropriate methods for the pipe or channel of interest: use of a calibrated direct read weir, the 0.9 times U-max or the 0.2, 0.4, or 0.8 methods shall be employed for low flow conditions in smaller pipes; and the 2-D method shall be used for higher flows in larger pipes. ALCOSAN shall also collect additional velocity measurements, as necessary, to obtain a representative range of field data points to ensure proper calibration.

14. ALCOSAN shall maintain flow monitoring devices to perform in accordance with manufacturers' specifications and applicable recommendations. ALCOSAN shall also remove sediment and gravel from or immediately adjacent to a flow monitoring device when such material interferes with proper operation of such flow monitoring device, and shall ensure that the sensor surfaces remain clean and in good condition.

Recording and Reporting Flow Monitoring Data

15. ALCOSAN shall maintain field logs (including calibration points) of all flow monitoring measurements and interrogations and shall provide such field logs to EPA, PADEP, and ACHD upon request.

16. ALCOSAN shall adopt file naming conventions and shall cross-reference these file-naming conventions with the file-naming conventions established by the Draft Plan.

17. In accordance with the schedule in Appendix X (Reporting Schedule), ALCOSAN shall submit to the Plaintiffs the following information:

a. digital flow monitoring data, in the format specified in the RCS Flow Monitoring Plan for ALCOSAN Point of Connection Meters, which preserves the raw monitoring data and incorporates separate columns for the QA/QC-reviewed and finalized monitoring data;

b. superimposed flow/level/rainfall versus time plots covering one-month intervals, beginning with the first day of the month; ALCOSAN shall prepare monthly flow, level and rainfall (vertical axis) versus time (horizontal axis) plots on a quarterly basis;

c. quality control documentation such as _scatter plots_ (flow versus level or velocity versus level) covering the entire monthly reporting period, using consistent, user-selected vertical axis scales, as opposed to varying computer selected axis scales; and

d. field measurement information, which ALCOSAN shall submit in a consistent format.

18. In accordance with the schedule in Paragraph 3(k), ALCOSAN shall provide to the Participating Municipalities through its secure website the following information for all of the Municipal Flow Meters, the Minicipal Pump Station Overflow Meters, and the CSO/SSO Structure Meters:

a. the comma delineated ASC II files of the digital flow monitoring data with a naming convention consistent with the requirements of Paragraph 16 of this Appendix; and

b. an electronic PDF file for the field logs, including calibration points described in Paragraph 15 of this Appendix, with a naming convention consistent with the requirements of Paragraph 16 of this Appendix.

19. Notwithstanding any other provision of this Consent Decree and this Appendix to the contrary, ALCOSAN shall not be required to perform quality assurance and quality control procedures on raw data collected from the Municipal Flow Meters. ALCOSAN shall, however, be required to take all reasonable measures included in the RCS Flow Monitoring Plan to assure that such raw data can be subject to quality assurance and quality control procedures.

TABLE M-1

List of Pump Station Locations

TABLE M-2

Number and Categories of Flow Meters for the Regional Flow Monitoring Plan

For purposes of this Appendix M the flow monitor types listed in Table M-1 below shall have the following meanings:

"ALCOSAN Point of Connection Meters" shall mean flow meters that measure flow at the Points of Connection as that term is defined by the Consent Decree.

"CSO/SSO Structure Meters" shall mean flow meters that measure flow from municipal combined sewer outfalls and municipal sanitary sewer outfalls.

"Pump Station Meters" shall mean flow meters that measure flow from Pump Station overflow pipes.

"ALCOSAN Pump Station Meters" shall mean flow meters in or as close as feasible to a pump station owned and/or operated by ALCOSAN.

"Municipal Pump Station Meters" shall mean flow meters in or as close as feasible to pump stations owned and/or operated by a Customer Municipality.

"Multi-Municipal Conveyance Sewer Meters" shall mean flow meters located on a trunk sewer that collects and conveys flow from more than one Municipality.

"Internal Municipal Overflow Meters" shall mean flow meters that measure Discharges that occur from the Municipal Collection System that have experienced basement flooding or surcharging manholes.

"Municipal Boundary Meters" shall mean flow meters at or close to a municipal boundary that monitor flow into or out of a given Municipality.

"Short-Term Municipal Boundary Meters" shall mean Municipal Boundary Meters metered for the duration specified in Paragraph 3.d of this Appendix.

"Long-Term Municipal Boundary Meters" shall mean Municipal Boundary Meters metered for the duration specified in Paragraph 3.b. of this Appendix.

"Internal Municipal Sub-Area Meters" shall mean flow meters that are located within internal municipal sewer systems used to collect information to support characterization of the sub-areas' responses to rainfall and to support capacity evaluations.

"Short-Term Internal Municipal Sub-Area Meters" shall mean Internal Municipal Sub-Area Meters metered for the duration specified in Paragraph 3.d. of this Appendix.

"Long-Term Internal Municipal Sub-Area Meters" shall mean Internal Municipal Sub-Area Meters metered for the duration specified in Paragraph 3.b. of this Appendix.

Table M-3

Supplanted Monitor Locations with Prior Municipal Data

APPENDIX N

Rainfall Monitoring

1. Beginning on the Date of Entry and continuing thereafter, ALCOSAN shall monitor rainfall within the Regional Collection System using a network of rain gauge stations and Doppler radar. ALCOSAN shall use a network of rain gauge stations with a minimum coverage of one rain gauge station per 60 square kilometers, as well as data compiled by Doppler radar utilizing a minimum resolution of one pixel per square kilometer, on or after April, 2000. ALCOSAN may substitute rainfall monitoring work completed by a third party or by ALCOSAN from 1997 until the present, using the available rain gauge station coverage so long as it: (a) was compiled by Doppler radar utilizing a minimum resolution of one pixel per 16 square kilometers; (b) meets the standards set forth in Paragraphs 2 through 5 of this Appendix; and (c) was of sufficient coverage to provide representative, accurate, and reliable rainfall monitoring data.

2. ALCOSAN shall obtain measurements using this network to: (a) provide representative, accurate, and reliable data over a range of wet weather events for at least 90 percent of the scheduled operating time for the aggregate of all rain gauge stations installed, (b) correlate various precipitation events with Wet Weather Flows within the Regional Collection System, and (c) use in development and Validation of the Hydrologic and Hydraulic Model.

3. Monitoring equipment calibration, maintenance, and data quality assurance checks shall be performed and/or verified such that monitoring accuracy is optimized, and is in conformance with the equipment manufacturers' recommendations and good engineering practices.

4. On an annual basis, or as recommended by the rain gauge manufacturer's specifications, whichever is more frequent, ALCOSAN shall use best efforts to obtain field calibration results for each gauge, along with an evaluation of the accuracy for each rain gauge. ALCOSAN shall also maintain this information and provide this calibration information to EPA, PADEP and/or ACHD upon request.

5. Beginning within six months of the Date of Entry, ALCOSAN shall establish and update on a quarterly basis on its publicly-accessible web site rainfall monitoring data that have been verified through a quality assurance process.

APPENDIX O

Combined Sewer Overflow Pollutant Monitoring

Combined Sewer Overflow Pollutant Monitoring Plan

1. Within four months after the Date of Entry, ALCOSAN shall submit to the Plaintiffs a proposed methodology for determining the concentrations of Pollutants in Discharges from the Combined Sewer Outfalls. This proposal shall be referred to as the "Combined Sewer Overflow Pollutant Monitoring Plan."

2. ALCOSAN shall utilize the information obtained through implementation of its Combined Sewer Overflow Pollutant Monitoring Plan, along with the Hydrologic and Hydraulic Model, required pursuant to Paragraph 39 of the Consent Decree, and Appendix P (Hydrologic and Hydraulic Model), to develop:

   a. the Wet Weather Plan required pursuant to Section VI (Clean Water Act Remedial Controls and Activities); and

   b. a Receiving Water Quality Model, if ALCOSAN is required to develop a Receiving Water Quality Model pursuant to Paragraphs 43, 52, and 56 of the Consent Decree.

3. Upon approval by EPA and PADEP in accordance with Section VIII (Review and Approval of Submittals), ALCOSAN shall commence implementation of its Combined Sewer Overflow Pollutant Monitoring Plan in accordance with the schedule and requirements set forth therein. That schedule shall require complete implementation of the plan such that the resulting information can be submitted with the information required pursuant to Paragraph 41 of the Consent Decree (Receiving Water Quality Monitoring) and utilized in the development of ALCOSAN's Wet Weather Plan.

4. In implementing its Combined Sewer Overflow Pollutant Monitoring Plan, ALCOSAN shall utilize one of the following two methods for determining the concentrations of Pollutants in Discharges from the Combined Sewer Outfalls:

a. ALCOSAN shall collect a series of composite and discrete samples of Combined Sewer Overflows from a representative sample of the Combined Sewer Outfalls (which shall include no less than 10% of all the Combined Sewer Outfalls) during each of at least six wet weather events (having two in each of three regional rainfall seasons, as well as an appropriate range of characteristics such as rainfall greater than one quarter of one inch but less than three inches, and duration greater than one hour) while simultaneously measuring the flow of Sewage to determine the volume of Discharge from the diversion chambers to their respective Outfalls. ALCOSAN shall then apply these data to calculate either:

i. a single, average volume-weighted event mean concentration value for each of the Pollutants identified in Paragraphs 8 and 9 below ("Combined Sewer Overflow Pollutant"), or

ii. a series (based on total event rainfall or other appropriate factor(s)) of average volume-weighted event mean concentration values for each Combined Sewer Overflow Pollutant; or

b. ALCOSAN shall collect at least three samples of Dry Weather Flow: (i) from locations that are upstream of a representative sample of the Combined Sewer Outfalls (which shall include such samples for no less than 10% of all the Combined Sewer Outfalls); and (ii) that are representative of the quality of Dry Weather Flow contributed to the

Regulators for these Combined Sewer Outfalls. ALCOSAN shall then calculate Outfall-specific, event-specific, Combined Sewer Overflow Pollutant concentrations for each model simulation using this sampling data, the Hydrologic and Hydraulic Model required by Appendix P (Hydrologic and Hydraulic Model), and the Event Mean Concentrations developed from a comprehensive analysis of available Storm Water quality data. The Storm Water quality data shall include:

i. values from the National Urban Runoff Program ("NURP") study;

ii. data provided to PADEP by Customer Municipalities as part of their Storm Water NPDES permit applications;

iii. representative Discharge data from the Industrial Users identified in Appendix F (Reduction of Water Quality Impacts from Industrial Users) discharging to the Regional Collection System; and

iv. other appropriate Storm Water quality data.

5. If ALCOSAN elects to utilize the methodology set forth in Paragraph 4(b) of this Appendix in its Combined Sewer Overflow Pollutant Monitoring Plan, then ALCOSAN shall also: (a) collect a series of composite and/or discrete samples of Combined Sewer Overflows from a representative sample of the Combined Sewer Outfalls (which shall include no less than 10% of all Combined Sewer Outfalls), during each of at least three wet weather events having an appropriate range of characteristics such as total rainfall, duration, and peak intensity; (b) simultaneously measure the flow of Sewage to determine the volume of Discharge from the diversion chambers to their respective Combined Sewer Outfalls; and (c) compare the Combined Sewer Overflow data generated by such sampling to the Combined Sewer Overflow Pollutant

concentration values generated using the methodology described in Paragraph 4(b) of this Appendix. ALCOSAN shall submit the results of this comparison to EPA, PADEP, and ACHD. If EPA and PADEP determine, based on this comparison, that one or more of the Combined Sewer Overflow Pollutant concentrations generated using this methodology are not representative, then EPA and PADEP may require ALCOSAN to investigate the causes of the discrepancies and, if appropriate, refine these Combined Sewer Overflow Pollutant concentration values by utilizing the data collected as described herein.

6. The data generated from sampling conducted pursuant to Paragraphs 4(a) and 5 of this Appendix shall reflect changes in Pollutant concentrations over time during a range of wet weather events appropriate to the development of the Wet Weather Plan pursuant to Section VI (Clean Water Act Remedial Controls and Activities). All wet weather sampling required by said Paragraphs shall be carried out in storms of sufficient duration and having sufficient rainfall intensities so as to result in significant Discharges from the Combined Sewer Outfalls and in significant and representative Storm Water contributions to Combined Sewer Overflow Pollutant loads.

7. ALCOSAN shall perform all sampling and analyses under this Appendix in accordance with the methodologies in 40 CFR Part 136 and EPA's 1999 "Combined Sewer Overflows: Guidance for Monitoring and Modeling," and any amendments thereto.

8. Based on the results of the sampling performed pursuant to Paragraph 4, above, ALCOSAN shall develop Combined Sewer Overflow Pollutant concentrations for the following Sewage Parameters or Pollutants for each Combined Sewer Outfall:

a. biochemical oxygen demand;

b. fecal coliform;

c. total suspended solids;

d. PCBs;

e. E-coli;

f. dissolved oxygen;

g. ammonia; and

h. nitrite plus nitrate.

9. For each of the locations identified in Appendix F (Reduction of Water Quality Impacts from Industrial Users), ALCOSAN also shall develop Combined Sewer Overflow Pollutant concentrations for the following Sewage Parameters or Pollutants that, based on the evaluation required pursuant to Appendix F, may be present or altered in Combined Sewer Overflows as a result of Discharges to the Conveyance and Treatment System from Industrial Users:

a. chemical oxygen demand;

b. cadmium;

c. chromium;

d. copper;

e. iron;

f. lead;

g. PCBs;

h. nickel;

i. silver;

j. pH; and

k. zinc.

10. ALCOSAN may petition EPA and PADEP for a reduction of the requirements of this Appendix by certifying that sufficient data have been collected to develop reliable inputs for the Receiving Water Quality Model.

Revised Combined Sewer Overflow Pollutant Monitoring Plan

11. Within 180 days after ALCOSAN completes its implementation of the approved Wet Weather Plan, ALCOSAN shall submit to the Plaintiffs, in accordance with Section VIII (Review and Approval of Submittals), a revised plan for monitoring Pollutants in Combined Sewer Overflows ("Revised Combined Sewer Overflow Pollutant Monitoring Plan").

12. Upon approval by EPA and PADEP, ALCOSAN shall commence implementation of its Revised Combined Sewer Overflow Pollutant Monitoring Plan in accordance with the schedule and requirements set forth therein. That schedule shall require complete implementation of the plan such that the results of that evaluation can be utilized in the implementation of the Post-Construction Receiving Water Quality Monitoring Plan required by Appendix Q (Receiving Water Quality Monitoring), and the development of a Receiving Water Quality Model, if ALCOSAN is required to develop a Receiving Water Quality Model pursuant to Paragraphs 43, 52, and 56 of the Consent Decree.

13. Once approved by the Plaintiffs in accordance with Section VIII (Review and Approval of Submittals), ALCOSAN shall utilize its Revised Combined Sewer Overflow Pollutant Monitoring Plan, along with the Hydrologic and Hydraulic Model described in Appendix P (Hydrologic and Hydraulic Model), and the receiving water quality monitoring data obtained pursuant to Appendix Q (Receiving Water Quality Monitoring), to develop the Post-Construction Receiving Water Quality Model required pursuant to Paragraphs 43, 52, and 56.

14. In implementing its Revised Combined Sewer Overflow Pollutant Monitoring Plan, ALCOSAN shall utilize the methods for determining Combined Sewer Overflow Discharge Pollutant concentrations set forth in Paragraphs 4 through 6 of this Appendix and shall also comply with the other requirements applicable to its original Combined Sewer Overflow Pollutant Monitoring Plan set forth in Paragraphs 7 through 9 of this Appendix.

APPENDIX P

Hydrologic and Hydraulic Model

Hydrologic and Hydraulic Model Plan

1. Within nine months after the Date of Entry, ALCOSAN shall submit to EPA and PADEP for review and approval, and to ACHD for review and comment, pursuant to Section VIII (Review and Approval of Submittals), a plan ("Hydrologic and Hydraulic Model Plan") for the development of a model to simulate the hydrology and hydraulics of flows, as set forth in this Appendix, in the Regional Collection System. The model shall be referred to as the "Hydrologic and Hydraulic Model."

2. The Hydrologic and Hydraulic Model shall include the entire Conveyance and Treatment System, as well as critical portions of the Municipal Collection Systems. For purposes of this Appendix, "Critical Portions of the Municipal Collection Systems" shall include all Outfalls in the Municipal Collection Systems (except for such Outfalls that would not, or are not planned to, route flow to the Conveyance and Treatment System), the portions of the Municipal Collection Systems downstream of those Outfalls, and any other portions of the Region Collection System for which inclusion is necessary for the model to simulate and predict the parameters in Paragraph 6 of this Appendix.

3. The Hydrologic and Hydraulic Model shall be developed so as to:

   a. achieve adequate model performance and accuracy;

   b. satisfy the requirements of Paragraph 6 of this Appendix; and

   c. support the development of the Wet Weather Plan that adequately addresses all identified Municipal Collection System sanitary sewer overflows, the elimination of which would result in increased flow to the Conveyance and Treatment System; and

d. support the development of the Wet Weather Plan that adequately addresses all identified Municipal Collection System combined sewer overflows, the elimination or reduction of which would result in increased flow to the Conveyance and Treatment System.

4. ALCOSAN shall ensure that the Hydrologic and Hydraulic Model is developed and Validated such that it can provide an accurate and reliable characterization of the volume and frequency of Discharges from the Conveyance and Treatment System for use in the development of the Wet Weather Plan. In its Hydrologic and Hydraulic Model Plan, ALCOSAN shall provide information regarding the model it proposes to utilize to satisfy the requirements of this Appendix, including the following information:

a. the name and type of the Hydrologic and Hydraulic Model;

b. whether or not the model is developed and approved by EPA, is publicly available, and is widely accepted and used by municipalities to model combined sewer systems;

c. if the proposed model has not been approved by EPA and is not widely accepted and used by municipalities to model combined sewer systems, the model's specific attributes, characteristics, limitations, and base algorithms for each major computational function;

d. all input parameters, constants, assumed values and expected outputs;

e. the computer hardware required to run the model;

f. digital maps and schematics that identify and characterize the portions of the Regional Collection System to be included in the proposed model;

g. how the model will be applied to simulate and predict wastewater flows through, and Discharges from, the Regional Collection System, both to develop information that will be submitted to support a request for a

Preliminary Determination regarding use of the Presumption Approach (pursuant to Paragraphs 45-48), and to support development of the Wet Weather Plan. This information shall include:

i. how attribute data accuracy and representativeness will be assured;

ii. the configuration of the proposed model;

iii. procedures and protocols for the performance of sensitivity analyses (*i.e.*, how the proposed model responds to changes in input parameters and variables);

iv. procedures (including measures to assure that calibration parameters such as pipe friction factors, are kept within acceptable ranges), using actual system data (*e.g.*, precipitation and flow data), for validating the proposed model's ability to predict accurate and representative (A) hydraulic grade lines and flow rates within the Conveyance and Treatment System, (B) hydraulic grade lines and flow rates of the Municipal Collection Systems at the points of connection to the Conveyance and Treatment System, (C) hydraulic grade lines and flow rates within Critical Portions of the Municipal Collection Systems, (D) flow values for Discharges from the Conveyance and Treatment System, and (E) flow rates and volumes for Discharges from Critical Portions of the Municipal Collection Systems included to achieve adequate Model performance and accuracy;

v. procedures and methodologies to account for the range of wet weather hydrographs and Sewage Parameters for each Combined

Sewer System and Sanitary Sewer System, and for each sewershed in its entirety within the Regional Collection System; and

vi. procedures for developing the model in two phases, first to support the development of a request for Preliminary Determination regarding use of the Presumption Approach (pursuant to Paragraphs 45-48 of the Consent Decree), and then, once additional data is available as a result of ongoing monitoring efforts, to refine the model using that additional data, to support development of the Wet Weather Plan.

5. Upon approval by EPA and PADEP in accordance with Section VIII (Review and Approval of Submittals), ALCOSAN shall implement the Hydrologic and Hydraulic Model Plan in accordance with the schedules and requirements set forth therein.

Hydrologic and Hydraulic Model Capabilities and Parameters

6. In developing the Hydrologic and Hydraulic Model in accordance with the approved Hydrologic and Hydraulic Model Plan, ALCOSAN shall utilize, among other information, the information collected pursuant to Appendices M (Flow Monitoring), R (Rainfall Monitoring), and O (Combined Sewer Overflow Pollutant Monitoring), and shall ensure that the Hydrologic and Hydraulic Model is capable of simulating and predicting the following parameters:

a. the peak flow capacity at all points within the Conveyance and Treatment System, at each Point of Connection and in Critical Portions of the Municipal Collection Systems;

b. the contribution of Storm Water to flows: (i) to each point within the Conveyance and Treatment System, (ii) at each Point of Connection and (iii) in Critical Portions of the Municipal Collection Systems;

c. the temporal variation in Storm Water flows at all of the locations identified in subparagraph 6(b), above;

d. the contribution of groundwater: (i) to each point within the Conveyance and Treatment System, (ii) at Points of Connection, and (iii) in Critical Portions of the Municipal Collection Systems,

e. the temporal variation in flows related to seasonal variation in groundwater levels at all of the locations identified in subparagraph 6(d), above;

f. the hydraulic grade line profiles, and the temporal variation in hydraulic grade line profiles, of wastewater during both dry weather and wet weather conditions (including, at a minimum, those rainfall conditions described in Paragraph 7, below) within the sewer pipes and sewer structures of the Conveyance and Treatment System, at each Point of Connection, and in Critical Portions of the Municipal Collection Systems;

g. the peak flow capacity of each Pump Station in the Conveyance and Treatment System and the peak flow capacity of each Pump Station within the Municipal Collection Systems for which information has been provided to ALCOSAN and that is relevant to the operation of the Conveyance and Treatment System;

h. for both wet weather (at a minimum, including those wet weather events described in Paragraph 7, below) and dry weather conditions, the temporal variation in flow (including the peak flow) for each Pump Station, interceptor, gravity sewer line, and force main within the Conveyance and Treatment System, at each Point of Connection, and in Critical Portions of the Municipal Collection Systems;

i. the wet weather hydrographs for each Combined Sewer System and Sanitary Sewer System sub-basin, and for each sewershed in its entirety within the Regional Collection System, including baseline wastewater flow that is routed through gravity sewer lines, Pump Stations, force mains, Regulators, and interceptors;

j. the location, duration, temporal variation in flow, and volume of all Sanitary Sewer Overflows and all combined sewer overflows from the Critical Portions of the Municipal Collection Systems;

k. the reduction of Sanitary Sewer System flow and/or other modifications that must be effected to eliminate Sanitary Sewer Overflows from the Sanitary Sewer Outfalls listed in Appendix B;

l. the impact of Inflow and Infiltration rehabilitation projects and stream removal projects on flows within, and Discharges from, the Conveyance and Treatment System, and on flows from the Municipal Collection Systems at their respective Points of Connection to the Conveyance and Treatment System, and on flows for Discharges from Critical Portions of the Municipal Collection Systems;

m. the impacts on flow and water quality within the Conveyance and Treatment System due to modifications planned by Customer Municipalities in the Regional Collection System for the purpose of eliminating Sanitary Sewer Overflows and eliminating or reducing combined sewer overflows;

n. for each of the various remedial control measures considered for the development of the Wet Weather Plan, the location, duration, temporal variation in flow and volume of all Sanitary Sewer Overflows and all Combined Sewer Overflows from the Outfalls listed in Appendices A and B, respectively, and:

   i. the extent to which such Sanitary Sewer Overflows will be eliminated from the Conveyance and Treatment System, and;

   ii. the annual average percent capture of Combined Sewer System flow generated in the Combined Sewer Systems on both a Combined Sewer System basin and system-wide basis; and

o. based on the information gathered and developed pursuant to Appendix O (Combined Sewer Overflow Pollutant Monitoring), the estimated Pollutant loads discharged from the Combined Sewer Outfalls listed in Appendix A.

7. ALCOSAN shall also ensure that the Hydrologic and Hydraulic Model is capable of simulating and predicting numerical values for each of the parameters identified above in Paragraph 6 of this Appendix for both baseline conditions (with the baseline year contemporaneous to the year or years upon which the "typical year" or "average year" is based), and conditions projected 20 years subsequent to completion of construction of the remedial controls, and implementation of the remedial activities, required under the approved Wet Weather Plan. Furthermore, the Hydrologic and Hydraulic Model shall be capable of continuous simulation of these values at each point of Discharge from the Regional Collection System, included in the Model under a range of Wet Weather Flow and Dry Weather Flow conditions. These conditions shall include, at a minimum:

a. continuous simulation of a "typical year" and/or "average year," based on the recorded rainfall volume and frequency of storms in the geographic area encompassing the Regional Collection System ("ALCOSAN Region");

b. continuous simulation, with statistical significance, of storms of 3-month-return intervals based on actual monitored temporal rainfall distribution data appropriate to the ALCOSAN Region; and

c. continuous simulation, with statistical significance, of storms of varying duration and intensity, including a 10-year return interval, 24-hour duration storm and a two-year return interval, 24-hour duration storm, based on actual monitored temporal rainfall distribution data appropriate to the ALCOSAN Region.

8. In its Hydrologic and Hydraulic Model, ALCOSAN shall take into account other relevant variables including, but not limited to: the age and condition of sewer system components; soil-type and porosity (where applicable); seasonally-varying groundwater Infiltration; amount of drainage area; service area size; impervious area; historic rainfall and

flow data; historic Inflow and Infiltration data; and current and projected population, river elevation; and seasonal population patterns, if applicable.

9. ALCOSAN shall configure the Hydrologic and Hydraulic Model based on representative, accurate, and verified data attributable to the Conveyance and Treatment System (*e.g.*, pipe sizes and invert elevations, manhole rim elevations) and Critical Portions of the Municipal Collection Systems. ALCOSAN shall also Validate the Hydrologic and Hydraulic Model according to accepted engineering practices using independent sets of spatially and temporally representative flow and rainfall data obtained or used under this Consent Decree. ALCOSAN shall, in configuring Critical Portions of the Municipal Collection Systems and Validating its Hydrologic and Hydraulic Model, utilize, respectively, all relevant available Municipal Collection System attribute data and flow data generated by and/or for the Customer Municipalities.

APPENDIX Q

Receiving Water Quality Monitoring

General Requirements

1. ALCOSAN shall monitor the water quality of receiving waters pursuant to Paragraph 41 of this Consent Decree to evaluate whether and to what extent these waters are in attainment with all applicable Water Quality Standards. Pursuant to Paragraph 42 of the Consent Decree, ALCOSAN shall also monitor the water quality of receiving waters to support the development and Validation of the Receiving Water Quality Model required under Paragraphs 43, 52, and 56 of this Consent Decree. In accordance with Paragraphs 41 and 42 of the Consent Decree and the requirements of this Appendix, ALCOSAN shall submit to the Plaintiffs for review and comment pursuant to Section VIII (Review and Approval of Submittals) a plan for monitoring receiving waters to evaluate water quality ("Receiving Water Quality Monitoring Plan") and, as applicable, a plan for monitoring receiving waters to support the development and Validation of the Receiving Water Quality Model ("Receiving Water Quality Model Validation Monitoring Plan").

2. Upon approval by EPA and PADEP, ALCOSAN shall implement the Receiving Water Quality Monitoring Plan and the Receiving Water Quality Model Validation Plan in accordance with the schedule and requirements therein.

3. ALCOSAN may, in lieu of some or all of the monitoring required to satisfy the requirements of this Appendix, utilize the data that was collected and/or used by a third party within that same time period, so long as all such receiving water quality data collected to evaluate attainment with all applicable Water Quality Standards meet the spatial, temporal, and analytical requirements of Paragraph 6(e) of this Appendix and those monitoring data used to support the Receiving Water Quality Model are collected within an appropriate time period and

are of adequate quality to support the development and Validation of the Receiving Water Quality Model required by Appendix R (Receiving Water Quality Model).

4. ALCOSAN shall include in the periodic progress reports required pursuant to Section VII (Reporting and Recordkeeping) the results for receiving water quality samples collected during each reporting period.

Receiving Water Quality Monitoring For Determining Attainment with Water Quality Standards

5. Within one year after the Date of Entry, ALCOSAN shall submit to the Plaintiffs, pursuant to Section VIII (Review and Approval of Submittals), a Receiving Water Quality Monitoring Plan for sampling the receiving waters to characterize the impacts of Combined Sewer Overflows on water quality and to determine whether and to what extent there is attainment of relevant and all applicable Water Quality Standards (a) prior to the submission of the Wet Weather Plan, (b) during the implementation of the Wet Weather Plan, and (c) during the Post-Construction monitoring period.

6. ALCOSAN shall include in its Receiving Water Quality Monitoring Plan provisions for:

a. collecting samples during an appropriate and representative range of dry and wet weather conditions;

b. collecting sufficient water quality samples to characterize, for all Sensitive Areas, water quality in receiving waters immediately adjacent to Combined Sewer Outfalls and in the locations downstream of Combined Sewer Outfalls that are likely to be impacted by Discharges from these Combined Sewer Outfalls;

c. selecting individual sampling locations, and establishing spatial distributions of those sampling locations, that are appropriate to the particular receiving waters;

d. sampling for the Sewage Parameters and Pollutants listed in Paragraphs 8 and 9 of Appendix O (Combined Sewer Overflow Pollutant Monitoring), with the exception of those parameters and pollutants that are expected to be present due to the contribution of Industrial Users and where no such Industrial Users' contributions are likely to exceed applicable Water Quality Standards for such parameters and pollutants;

e. sufficient sampling to evaluate attainment with all applicable Water Quality Standards (*e.g.*, if five samples within a 30 day period are required to assess attainment of such Water Quality Standards, then ALCOSAN shall collect five samples within a 30 day period);

f. sampling and analysis in accordance with EPA's 1999 "Combined Sewer Overflows: Guidance for Monitoring and Modeling" and 40 C.F.R. Part 136; and

g. giving highest priority to the evaluation of attainment in Sensitive Areas.

7. ALCOSAN shall also provide in its Receiving Water Quality Monitoring Plan provisions for receiving water sampling in accordance with the schedule in such plan through the Post-Construction monitoring period, and shall tailor the receiving water sampling, as appropriate, to ensure that it achieves the requirements of this Appendix. The plan may require fewer numbers of receiving water sampling events prior to the request for Preliminary Determination and during implementation of the Wet Weather Plan, while specifying a more frequent number of receiving water sampling events to evaluate the effectiveness of Combined Sewer Overflow controls during implementation of the approved Wet Weather Plan, as remedial control measures are constructed and as remedial control measures are implemented in those portions of the Conveyance and Treatment System, and during the Post-Construction monitoring period. ALCOSAN shall also include in its Receiving Water Quality Monitoring Plan a schedule identifying which monitoring activities will be completed prior to (a) the submission of any request for a Preliminary Determination, (b) the submission of a Wet Weather Plan based on the

Presumption Approach, and (c) the submission of a Wet Weather Plan based on the Demonstration Approach. This schedule shall also ensure that ALCOSAN completes receiving water sampling to evaluate attainment with all applicable Water Quality Standards for bacteria in at least one location in each Sensitive Area prior to submission of a request for a Preliminary Determination pursuant to Paragraphs 45 through 47 of this Consent Decree.

8. If the Wet Weather Plan identifies dates for implementing combined sewer overflow remedial control measures likely to achieve interim improvements in water quality, the Receiving Water Quality Monitoring Plan should include a receiving water sampling schedule to evaluate the effectiveness of such measures.

9. ALCOSAN shall submit a revised Receiving Water Quality Monitoring Plan in the following circumstances:

a. EPA and/or PADEP determine that the receiving water quality data obtained as a result of ALCOSAN's implementation of its approved Receiving Water Quality Monitoring Plan are not sufficient to support the remedial control measures proposed by ALCOSAN as part of its Wet Weather Plan, and additional receiving water quality monitoring is necessary to support the measures ALCOSAN is proposing;

b. EPA and/or PADEP determine that the Receiving Water Quality Monitoring Plan does not otherwise meet the requirements of this Appendix;

c. it is two years prior to the estimated completion of construction of the remedial controls and implementation of the remedial activities required in the approved Wet Weather Plan, as set forth in Paragraph 10 of this Appendix

d. ALCOSAN submits a revised Wet Weather Plan in accordance with Paragraph 67 of this Consent Decree; and/or

e. ALCOSAN submits a proposed modification to its Receiving Water Quality Monitoring Plan.

10. The provisions of ALCOSAN's Receiving Water Quality Monitoring Plan governing Post-Construction monitoring shall be considered preliminary. Two years prior to the estimated completion of construction of the remedial controls and implementation of the remedial activities required under the approved Wet Weather Plan, ALCOSAN shall submit, if appropriate, to the Plaintiffs for review and approval, in accordance with Section VIII (Review and Approval of Submittals), proposed modifications to the Post-Construction monitoring provisions of its Receiving Water Quality Monitoring Plan.

11. To ensure that the Post-Construction receiving water quality monitoring is sufficient to determine Post-Construction attainment with all applicable Water Quality Standards, ALCOSAN shall extend sampling periods, if necessary, to ensure representation of sufficient wet weather events during the proposed sampling period(s).

Receiving Water Quality Monitoring For Developing and Validating the Receiving Water Quality Model

12. If ALCOSAN develops a Receiving Water Quality Model pursuant to this Consent Decree, then ALCOSAN shall submit the Receiving Water Quality Model Validation Monitoring Plan. ALCOSAN shall submit the Receiving Water Quality Model Validation Monitoring Plan in accordance with Section VIII (Review and Approval of Submittals) on or before the date the ALCOSAN submits its Receiving Water Quality Model Plan.

13. ALCOSAN shall include in its Receiving Water Quality Model Validation Monitoring Plan procedures for collecting adequate water quality sampling data to support the development and Validation of the Receiving Water Quality Model and water quality assessment tools required by Appendix R (Receiving Water Quality Model) such that the model is capable of characterizing:

a. the water quality in the receiving waters, as defined in Appendix R (Receiving Water Quality Model), during a range of wet and dry weather conditions, including the water quality response of such "receiving waters" to a range of wet and dry weather conditions;

b. the impacts of Discharges from the Conveyance and Treatment System, including those that may include Discharges from Industrial Users (in accordance with Appendix F,) on the water quality of such receiving waters during a range of dry and wet weather conditions; and

c. the impacts of Discharges from the Regional Collection System on the water quality of such receiving waters during a range of dry and wet weather conditions.

14. ALCOSAN shall include in its Receiving Water Quality Model Validation Monitoring Plan provisions for:

a. collecting samples during an appropriate range of dry and wet weather conditions to support the purposes identified in Paragraph 13 of this Appendix;

b. collecting samples in receiving waters at locations to allow for the characterization of:

i. the extent to which various Pollutant load sources contribute to adverse impacts on receiving water quality, including Pollutants discharged from Separate and Combined Sewer Systems;

ii. water quality throughout all receiving waters impacted by Combined Sewer Overflows from the Conveyance and Treatment System; and

iii. water quality in areas downstream of the Combined Sewer Outfalls that are likely to be impacted by Discharges from these Combined Sewer Outfalls.

c. ensuring that the individual sampling locations and the spatial distribution of those sampling locations is appropriate to the receiving water, that sampling on the three largest rivers will involve a combination of both centerline samples and series of transects at appropriate spacing (as well as a series of centerline samples on smaller rivers and streams), and that,

as appropriate, sampling in the three large rivers will involve sampling at multiple depths.

d. conducting sampling for the Sewage Parameters and Pollutants listed in Paragraphs 8 and 9 of Appendix O (Combined Sewer Overflow Pollutant Monitoring), except, however, that ALCOSAN need not sample for those Sewage Parameters and Pollutants that are expected to be present due to the contribution of Industrial Users where no such Industrial Users are likely to contribute to an exceedance of all applicable Water Quality Standards;

e. conducting sampling during a sufficient number and an appropriate range of magnitude of storms to support the purposes identified in Paragraph 13 of this Appendix; and

f. conducting sampling and analysis in accordance with EPA's Combined Sewer Overflow Policy and 40 C.F.R. Part 136.

When characterizing impacts to water quality for small tributaries upstream of Combined Sewer Outfalls, ALCOSAN may limit sampling to locations immediately upstream of the confluence of such streams with the Allegheny, Ohio, or Monongahela Rivers.

15. ALCOSAN shall include in its Receiving Water Quality Model Validation Monitoring Plan a schedule of sampling activities, including extended sampling periods should insufficient wet weather events occur during the proposed sampling period(s), to ensure that ALCOSAN's Receiving Water Model Validation Monitoring Plan is consistent with the requirements of this Appendix.

APPENDIX R
Receiving Water Quality Model

1. ALCOSAN shall develop a water quality model to characterize impacts on receiving waters from Combined Sewer Overflows (a) if ALCOSAN selects the Demonstration Approach as set forth in Paragraph 53 of this Consent Decree, or (b) if EPA and PADEP provide ALCOSAN with a determination of nonattainment based on Post Construction water quality monitoring (as provided in Paragraphs 43, 52, and/or 56 of this Consent Decree).

2. Not later than one year prior to the date of submission of the Wet Weather Plan based on the Demonstration Approach, ALCOSAN shall submit to the Plaintiffs, pursuant to Section VIII (Review and Approval of Submittals), a "Receiving Water Quality Model Plan" for the development of one or more model(s) and other receiving water assessment tools to characterize the effects of Combined Sewer Overflows and Sanitary Sewer Overflows from the Conveyance and Treatment System, if any, on water quality in the receiving waters. For purposes of this Appendix, the "receiving waters" shall mean the following water bodies: Ohio River, Monongahela River, Allegheny River, Turtle Creek, Chartiers Creek and Sawmill Run.

3. ALCOSAN shall utilize the water quality model(s) and/or assessment tools to characterize these effects under conditions existing at the time of development of the Wet Weather Plan (if such modeling is required in accordance with the Consent Decree) both with and without the implementation of remedial control measures. In addition, should Post-Construction water quality monitoring performed in accordance with this Consent Decree not demonstrate to the satisfaction of EPA, PADEP and ACHD that the receiving waters are in attainment with the all applicable Water Quality Standards for the Sewage Parameters and Pollutants (except for PCBs) set forth in Paragraphs 8 and 9 of Appendix O (Combined Sewer Overflow Pollutant Monitoring), then ALCOSAN shall also utilize the model(s) and/or assessment tools to characterize the effects of Combined Sewer Overflows and Sanitary Sewer Overflows from the Conveyance and Treatment System, on receiving water quality under the conditions existing at the time of completion of construction of the remedial controls, and

implementation of the remedial activities required under the approved Wet Weather Plan, and 20 years thereafter.

4. In its Receiving Water Quality Model Plan, ALCOSAN shall propose one or more appropriate computer model(s) to assess flow and water quality in the receiving waters. In the remaining receiving streams within ALCOSAN's service area, ALCOSAN shall utilize either the same models and /or assessment tools that it is utilizing for the receiving waters or other appropriate models and/or appropriate assessment tools, described in EPA's 1999 "Combined Sewer Overflow Guidance for Modeling and Monitoring." ALCOSAN shall select appropriate water quality assessments tools that are appropriate for the hydraulic characteristics of each of the smaller streams, and that provide an accurate and representative assessment of water quality impacts.

5. In its Receiving Water Quality Model Plan, ALCOSAN shall provide the following information regarding each of the specific model(s) it proposes to use on each of the receiving waters and, except as provided herein, on each receiving stream for which ALCOSAN proposes a model in its Receiving Water Quality Model Plan:

a. a description of the water quality model(s);

b. a determination of whether or not the model has been developed and approved by EPA, whether it is publicly available, rather than proprietary, and whether or not the model has been widely accepted by the technical community;

c. if the proposed model has not been approved by EPA, is not publicly available, or not widely accepted by the technical community, the model's specific attributes, characteristics, limitations, and base algorithms for each major computational function;

d. how ALCOSAN shall configure that water quality model based on representative, accurate, and verified data so to as to achieve adequate model performance and accuracy;

e. all input parameters, constants, assumed values and expected outputs;

f. the computer hardware required to run the model;

g. for any model of receiving waters, a digital map that illustrates the portions of each of the receiving waters to be included in the proposed model, and that illustrates how each will be broken down into segments; and

h. for any model of receiving waters, a description of how the model will be applied to simulate and predict stream flow and water quality, including:

i. how data accuracy and representativeness will be assured;

ii. the configuration of the proposed model;

iii. procedures and protocols for the performance of sensitivity analyses (*i.e.,* how the proposed model responds to changes in the technical input parameters and variables); and

iv. procedures for Validating the proposed model's ability to adequately predict accurate and representative stream flows and water quality, using independent sets of spatially and temporally representative flow and rainfall data obtained or used pursuant to this Consent Decree, including measures to assure that calibration variables are kept within acceptable ranges.

6. In its Receiving Water Quality Model Plan, ALCOSAN shall also provide the following information regarding each of the water quality assessment tool(s) it proposes to use on a receiving stream or a receiving water:

a. a description of the water quality assessment tool and a justification for its use on each stream for which it is proposed;

b. if the proposed tool is not recommended by EPA for use in the development of wet weather plans (or long term control plans), a summary of relevant technical references (with those references appended thereto) demonstrating the tool's applicability to the proposed usage;

c. all input parameters, constants, assumed values, and expected outputs;

d. a map that illustrates the portions of each of the receiving waters and streams to be included in the proposed assessment tool, and that illustrates how, if appropriate, each will be broken down into segments for analysis; and

e. a description of how it will be applied to simulate and predict water quality, including procedures for verifying the proposed water quality assessment tool's ability to adequately predict accurate and representative water quality, by comparing the tools outputs to actual water quality data.

7. In developing the Receiving Water Quality Models and assessment tools in accordance with the approved Receiving Water Quality Model Plan, ALCOSAN shall utilize, among other information, the information collected pursuant to Appendices M (Flow Monitoring), N (Rainfall Monitoring), O (Combined Sewer Overflow Pollutant Monitoring), P (Hydrologic and Hydraulic Model) and Q (Receiving Water Quality Monitoring) and shall ensure that the Receiving Water Quality Models and assessment tools are capable of simulating and predicting the following:

a. the effect of Discharges from the Conveyance and Treatment System on receiving water quality in the receiving waters for both individual storm events and for long term (*i.e.*, "typical year") simulations, including, if ALCOSAN submits a Wet Weather Plan based on the Demonstration Approach, whether the remedial controls and activities identified in any such proposed plan will be sufficient to bring ALCOSAN into compliance with Paragraphs 16 through 18 of the Consent Decree and, regardless of the wet weather approach utilized, whether the remedial controls and activities actually implemented by ALCOSAN under this Consent Decree have been sufficient to bring ALCOSAN into compliance with Paragraphs 16 through 18 of the Consent Decree;

b. the effect of Discharges from the Conveyance and Treatment System and Critical Portions of the Municipal Collection Systems (as defined in Appendix P (Hydrologic and Hydraulic Model)) on receiving water quality in the receiving waters under current conditions and under conditions existing after the implementation of the approved Wet Weather Plan and for 20 years thereafter, for both individual storm events and for long term (*i.e.*, "typical year") simulations;

c. the effect that Pollutants contributed by sources other than the Regional Collection System have upon receiving water quality in the receiving waters under current conditions and under conditions existing after the implementation of the approved Wet Weather Plan and for twenty years thereafter, for both individual storm events and for long term (*i.e.*, "typical year") simulations;

d. spatial and temporal changes in concentrations for Pollutants of concern;

e. the duration of exceedance of all applicable Water Quality Standards at any specified point in the receiving waters during individual storms and long term simulations, and the effect of Discharges from the Conveyance and Treatment System upon the duration, frequency, magnitude, and spatial extent of any such exceedances;

f. the contribution and effects of different river conditions on the temporal and spatial extent of exceedances of all applicable Water Quality Standards during individual storm simulations and during long term wet weather simulations;

g. resuspension of bacteria from sediment sources; and

h. sediment oxygen demand and algal effects.

8. ALCOSAN shall also ensure that all Receiving Water Quality Models and water quality assessment tools used are capable of simulating and predicting numerical values for each of the Sewage Parameters or Pollutants (except for PCBs) set forth in Paragraphs 8 and 9 of Appendix O (Combined Sewer Overflow Pollutant Monitoring) for both current conditions and

for conditions projected upon completion of construction of the remedial controls and implementation of the remedial activities required under the approved Wet Weather Plan and 20 years thereafter. Furthermore, the models shall be capable of continuous simulation of these values in the receiving waters under a range of Wet Weather Flow and Dry Weather Flow conditions that shall include, at a minimum:

a. continuous simulation of a "typical year" and/or "average year," which shall be based on the recorded rainfall volume and frequency of storms in the ALCOSAN region;

b. continuous simulation, with statistical significance, of storms of sufficient duration and having sufficient rainfall intensities so as to result in significant activation of the Combined Sewer Outfalls and in representative Storm Water contribution to Combined Sewer Overflow Pollutant loads, based on actual monitored temporal rainfall distribution data appropriate to the ALCOSAN region; and

c. continuous simulation, with statistical significance, of storms of varying duration and intensity, including: (i) a 10-year return interval, 24-hour duration storm and (ii) a two-year return interval, 24-hour duration storm, based on actual monitored temporal rainfall distribution data appropriate to the Regional Collection System.

9. In its Receiving Water Quality Model Plan, ALCOSAN shall also propose a schedule for the development of each model and water quality assessment tool, consistent with the schedules set forth in the Consent Decree for implementation of the Receiving Water Quality Monitoring Plan and the Wet Weather Plan.

10. Upon approval of the Receiving Water Quality Model Plan in accordance with Section VIII (Review and Approval of Submittals), ALCOSAN shall implement the plan in accordance with the approved schedule and terms set forth therein.

APPENDIX S

Wet Weather Plan Requirements for Presumption Approach

1. ALCOSAN shall evaluate a range of remedial controls and remedial activities predicted to accomplish the requirements of Paragraphs 16, 17, 18(b), and 18(c) of the Consent Decree. In its evaluation of each potential remedial control and activities, ALCOSAN shall use the Hydrologic and Hydraulic Model to simulate:

   a. conditions as they exist at the time of submission, flows generated within the existing Regional Collection System, flows from the Regional Collection System to the Conveyance and Treatment System, and Combined Sewer Overflows and Sanitary Sewer Overflows from the Conveyance and Treatment System to receiving waters; and

   b. conditions as they are expected to exist after construction and operation of the range of remedial controls and the implementation of the remedial measures identified by ALCOSAN pursuant to this Paragraph, flows generated within the existing Regional Collection System, flows from the Regional Collection System to the Conveyance and Treatment System, and Combined Sewer Overflows and Sanitary Sewer Overflows from the Conveyance and Treatment System to receiving waters.

Such flows shall be simulated for the conditions identified in Paragraph 7 of Appendix P (Hydrologic and Hydraulic Model).

2. ALCOSAN shall evaluate the effectiveness (in terms of Pollutant loading reductions for Discharges from the Conveyance and Treatment System) and water quality benefits of constructing and implementing various remedial controls and remedial activities and combinations of such controls and activities, which shall include, but not be limited to:

   a. construction of sewage treatment plant(s) in addition to the Sewage Treatment Plant;

   b. storage of Wet Weather Flows;

c. construction of facilities (such as high rate treatment or ballasted flocculation facilities) for providing, at minimum, Primary Treatment to captured Combined Sewer Overflows;

d. construction of facilities for providing disinfection (and dechlorination if necessary) of Combined Sewer Overflows;

e. construction of facilities for removing solids and floatables from Combined Sewer Overflows;

f. construction of relief sewers;

g. relocation of Combined Sewer Outfalls;

h. implementation of pretreatment measures to reduce flows and/or Pollutants discharged into the Regional Collection System from Industrial Users; and

i. construction and/or implementation of combinations of the above remedial control measures.

ALCOSAN shall first consider the practical and technical feasibility of each remedial control and each remedial activity. It shall then analyze the costs and benefits of each option found to be practically or technically feasible in accordance with Appendix U (Cost Analysis for Combined Sewer Overflow Remedial Controls and Remedial Activities).

3. ALCOSAN shall include, with input from each Customer Municipality pursuant to Section VI, Subsection N (Coordination with Customer Municipalities):

a. the total service population for the area that is tributary to each Point of Connection, and the forecasts of total flow (in gallons per day and, if available, in gallons-per-day-per-inch-mile of sewer line) that each Point of Connection will contribute to the Conveyance and Treatment System upon implementation of the Wet Weather Plan;

b. a determination of the flows from both the contributing Combined Sewer System and/or the Sanitary Sewer System at each Point of Connection, a description of how each such determination was made, and a description of how such flows will be managed and/or maintained at each Point of Connection; and

c. a program for managing contributions from the Customer Municipalities so that such contributions to the Conveyance and Treatment System do not either result in exceedances of system capacity or preclude attainment of all applicable Water Quality Standards.

4. Based on the evaluations required by this Appendix and Section VI of the Consent Decree (Clean Water Act Remedial Controls and Activities), ALCOSAN shall propose to EPA and PADEP for review and approval, and to ACHD for comment, in accordance with Section VIII (Review and Approval of Submittals), remedial controls and remedial activities that will best achieve the requirements of Paragraphs 16 through 18 of the Consent Decree. With this proposal, ALCOSAN shall identify which of these remedial controls and remedial activities it proposes to construct and implement, and shall detail the design criteria and quantifiable performance criteria for those controls and activities. These design criteria and performance measures shall include, but not be limited to:

a. pumping capacities of Pump Stations;

b. design capacity of storage facilities;

c. percentage removal of specified Pollutants by treatment facilities; and

d. concentration and/or mass loadings for specified Pollutants.

5. ALCOSAN shall describe in its Wet Weather Plan a phased program for constructing the remedial controls and for implementing the proposed remedial activities, including, at a minimum, a schedule and budget for the following phases of construction and implementation for the Conveyance and Treatment System:

a. preliminary design;

b. final design;

c. bidding and bid review, if any;

d. initiation of construction and/or implementation;

e. initiation of operation for constructed remedial controls; and

f. performance testing.

6. After completing construction of the remedial controls and implementation of the remedial activities pursuant to the approved Wet Weather Plan, ALCOSAN shall, on an annual

basis, submit to EPA and PADEP for review and approval proposed best management practices for the operation and maintenance of each remedial control and each remedial activity implemented for the first time in the year in question. Upon approval by EPA and PADEP in accordance with Section VIII (Review and Approval of Submittals), ALCOSAN shall incorporate the best management practices into its Operation and Maintenance Manuals.

APPENDIX T

Bypass Demonstration

1. If ALCOSAN wishes to propose as part of the Wet Weather Plan referred to in this Consent Decree that it be allowed to bypass all or any portion of the primary or secondary treatment process at the Sewage Treatment Plant, ALCOSAN shall demonstrate, to EPA's and PADEP's satisfaction, at a minimum, the following:

   a. that the proposed bypass is unavoidable to prevent severe property damage;

   b. that it is either technically or financially infeasible to provide full treatment for the Wet Weather Flow that ALCOSAN proposes to bypass. For the purposes of this Section "Full Treatment" shall mean that flow shall not be routed around any treatment unit or process within the Sewage Treatment Plant. This demonstration shall include:

      i. consideration of enhanced treatment (*e.g.*, chemical addition) in the primary clarifiers and use of non-biological technologies in the secondary treatment units;

      ii. justification for the cut-off point at which the flow shall be diverted from the primary or secondary treatment process at the Sewage Treatment Plant;

      iii. a demonstration that conveyance of Wet Weather Flow to the Sewage Treatment Plant for partial treatment is more appropriate than other remedial control measures (such as storage and pump back for secondary treatment, satellite treatment, etc.); and

      iv. a demonstration that the secondary treatment portion of the Sewage Treatment Plant in its current form is properly operated and maintained and that the Sewage Treatment Plant is designed to meet secondary limits for flows greater than the Peak Dry Weather Flow plus an amount of Wet Weather Flow equal to 25% of Peak Dry Weather Flow;

c. that the character (including chemical composition) of the material entering the Sewage Treatment Plant for treatment renders it appropriate for less than Full Treatment;

d. that the final effluent discharged from the Sewage Treatment Plant shall not cause or contribute to a violation of all applicable Water Quality Standards;

e. that all flow entering the Sewage Treatment Plant shall receive at least Primary Treatment, solids and floatables removal and disinfection;

f. a discussion of what additional treatment with respect to the existing Sewage Treatment Plant processes, such as chemically-assisted clarification, ballasted flocculation, lamella clarification, micro filtration, and dissolved air flotation, may be reasonably provided; and

g. that Core Flow, as defined below, will receive Secondary Treatment. For purposes of this Subparagraph, "Core Flow" shall mean:

i. peak flow that is generated in Sanitary Sewer Systems (regardless of whether such flow is Wet Weather Flow or Dry Weather Flow) and routed to the Conveyance and Treatment System; and

ii. 125% of Peak Dry Weather Flow that is generated in the Combined Sewer System and routed to the Conveyance and Treatment System.

2. If ALCOSAN satisfactorily demonstrates the above, then, in so bypassing at the Sewage Treatment Plant, ALCOSAN shall:

a. optimize operation of all treatment units and processes at the Sewage Treatment Plant, particularly during periods of high flow, so that all flow, no matter how routed through the Sewage Treatment Plant, receives as much treatment as feasible, consistent with maintaining optimum treatment and effluent quality;

b. when flows into the Sewage Treatment Plant do not exceed Plant Secondary Capacity, ensure that any Discharge from the Sewage

Treatment Plant shall meet all permit limits, *i.e.*, both technology-based and water quality-based limits;

c. achieve Secondary Treatment for any flow that is not routed around any treatment unit at the Sewage Treatment Plant;

d. ensure that all Core Flow achieves Secondary Treatment, regardless of whether the Core Flow exceeds Plant Secondary Capacity;

e. sample every day any flow that receives less than Full Treatment;

f. demonstrate that the average of all daily samples taken pursuant to Subparagraph 2(e), above, achieves a percent reduction in carbonaceous biochemical oxygen demand and total suspended solids that the Plaintiffs have approved in writing for such bypassed flow during the event;

g. ensure that all Discharges from the Sewage Treatment Plant meet water quality-based permit limits at all times, except that Discharges from any permitted Outfall at the Sewage Treatment Plant during periods of preauthorized bypass, as described above, need not meet the technology-based effluent limits required by 40 C.F.R. Part 133 for the time period that flows into the Sewage Treatment Plant are being bypassed;

h. on each day during a month with preauthorized bypass, collect analytical data on the monthly technology-based limits under 40 C.F.R. Part 133 (such as the 85% removal requirement), and report the analytical data to the entities designated in the NPDES Permit to receive such data; and

i. not use analytical data that was gathered on days during which bypassing occurred to calculate the average of any monthly, weekly or daily technology-based effluent limitation for the applicable time period.

APPENDIX U

Cost Analysis for Combined Sewer Overflow Remedial Controls and Remedial Activities

1. ALCOSAN shall distinguish between those controls and activities evaluated and/or proposed under the Wet Weather Plan that are for eliminating Sanitary Sewer Overflows from the Conveyance and Treatment System and those that are for controlling Combined Sewer Overflows. ALCOSAN's evaluation of remedial controls and remedial activities for Combined Sewer Overflows shall be consistent with the guidance provided in Chapter 3 of the Combined Sewer Overflows: Guidance for Long-Term Control Plan, Office of Water EPA 832-B-95-002, September, 1995 ("LTCP Guidance"). In particular, ALCOSAN shall include in its evaluation of such remedial controls and remedial activities:

a. an assessment of a range of "sizes" of each remedial control and activity considered ("size" may be defined based on the percentage of untreated Combined Sewer Overflow (*e.g.*, 0-5%, 6-10%, 11-15% and 16-20%));

b. an evaluation of the "Project Costs," as that term is described on pages 3-49 through 3-51 of the LTCP Guidance, for each remedial control and each remedial activity, or mix of remedial and control activities, which ALCOSAN has evaluated. The evaluation of Project Costs shall include:

i. the total project costs for each remedial control and remedial activity or mix of remedial controls and activities, and a break down of the capital costs, annual operation and maintenance costs, and life cycle costs which went into calculating the total project costs for each remedial control and each remedial activity or mix of remedial controls and activities; and

ii. the project costs for each separate component of each remedial control and each remedial activity or mix of remedial controls and activities, and a break down of the capital costs, annual operation and maintenance costs, and life cycle costs which went into calculating the project costs for each separate component of each

remedial control and each remedial activity , or mix of remedial controls and activities. The terms "project costs," "capital costs," "annual operation and maintenance costs" and "life cycle costs" shall have the meaning ascribed to them on pages 3-49 and 3-51 of the LTCP Guidance;

c. an evaluation of ALCOSAN's financial capability to fund all remedial controls and remedial activities for Combined Sewer Overflows that have been considered. This evaluation shall include an evaluation of factors such as:

   i. Median household income/total project cost per household;

   ii. Per capita debt as a percent of full market property value;

   iii. Property tax revenues as a percent of full market property value;

   iv. Property tax collection rate;

   v. Unemployment;

   vi. Bond rating;

   vii. Grant and loan availability;

   viii. Current and projected residential, commercial and Industrial User fees;

   ix. Other viable funding mechanisms and sources of financing; and

   x. Other factors which ALCOSAN believes are important for this financial evaluation;

d. "knee of the curve" cost-performance analyses of the range of options that are being considered that will allow for the comparison of the costs per unit of measure (in mass) of Pollutants removed from the Discharges for each of the remedial controls and each of the remedial activities that is being considered; The knee of the curve analysis compares the benefit of a particular project to the cost with a point on the graph (the knee of the curve) where the ratio of cost to benefit increases dramatically. An assessment of costs and financial capability on a regional basis, *i.e.*, accounting for the overall costs and economic feasibility of

implementation of combined sewer overflow controls and measures for ALCOSAN and all Customer Municipalities that operate Combined Sewer Systems. In performing this assessment, ALCOSAN shall consider the controls and measures proposed in any and all long term control plans developed by the Customer Municipalities and obtained by ALCOSAN pursuant to Section VI, Subsection N (Coordination with Customer Municipalities) of the Consent Decree; and

e. an assessment of total Wet Weather Plan costs.

APPENDIX V

Wet Weather Plan Requirements for Demonstration Approach

1. ALCOSAN shall use, *inter alia*, the Hydrologic and Hydraulic Model and Water Quality Model to determine what reductions in Pollutant loads from the Combined Sewer Overflows in the Conveyance and Treatment System are necessary to achieve the requirements of Paragraphs 16, 17, and 18(a) of the Consent Decree.

2. ALCOSAN shall evaluate a range of remedial controls and remedial measures predicted to accomplish the requirements identified in Paragraphs 16, 17, and 18(a) of the Consent Decree.

3. At a minimum, ALCOSAN shall include in its evaluation:

   a. using the Hydrologic and Hydraulic Model to simulate conditions as they exist at the time of submission:

      i) flows generated within the existing Regional Collection System,

      ii) flows generated from the Municipal Collection Systems to the Conveyance and Treatment System, and

      iii) using the Receiving Water Quality Model, Combined Sewer Overflows and Sanitary Sewer Overflows from the Conveyance and Treatment System to receiving waters, including how those Discharges cause or contribute to exceedances of all applicable Water Quality Standards; and

   b. using the Hydrologic and Hydraulic Model and the Receiving Water Quality Model to simulate conditions as they are expected to exist after construction of such remedial controls and implementation of such remedial activities:

i) flows generated within the existing Regional Collection System,

ii) flows from the Municipal Collection Systems to the Conveyance and Treatment System, and

iii) using the Receiving Water Quality Model, the Combined Sewer Overflows and Sanitary Sewer Overflows from the Conveyance and Treatment System to receiving waters, including how those Discharges are predicted to cause or contribute to an exceedance of an applicable Water Quality Standard.

ALCOSAN shall simulate for each such flow, for the conditions identified in Paragraph 7 of Appendix P (Hydrologic and Hydraulic Model).

4. ALCOSAN shall evaluate the effectiveness (in terms of Pollutant loading reductions for Discharges from the Conveyance and Treatment System) and the water quality benefits of constructing various remedial controls and implementing various remedial activities, and combinations of controls and activities, which shall include, but not be limited to:

a. construction of sewage treatment plant(s) in addition to the Sewage Treatment Plant;

b. storage of Wet Weather Flows;

c. construction of remedial controls (such as high rate treatment or ballasted flocculation facilities) to address captured Combined Sewer Overflows;

d. construction of facilities for providing disinfection (and dechlorination if necessary) of Combined Sewer Overflows;

e. construction of facilities for removing solids and floatables from Combined Sewer Overflows;

f. construction of conveyance lines or parallel interceptors;

g. relocation of Combined Sewer Outfalls;

h. implementation of pretreatment measures to reduce flows and/or Pollutants discharged into the Regional Collection System from Industrial Users;

i. construction and/or implementation of combinations of the above remedial controls and activities.

ALCOSAN shall first consider the practical and technical feasibility of each remedial control and each remedial activity. It shall then analyze the costs and benefits of each option not found to be practically or technically infeasible in accordance with Appendix U (Cost Analysis for Combined Sewer Overflow Remedial Controls and Remedial Activities).

5. ALCOSAN's evaluation shall include an estimate of the probability of the occurrence of exceedances of all applicable Water Quality Standards resulting from Combined Sewer Overflows from the Conveyance and Treatment System under each of the remedial controls and each of the remedial activities considered. In performing the evaluation of remedial controls and remedial activities required by Paragraph 2 of this Appendix, ALCOSAN shall determine for each of the remedial controls and each of the remedial activities considered:

a. the predicted capacity of the Regional Collection System for each proposed remedial controls and each remedial activity to convey flow to the Sewage Treatment Plant;

b. the predicted amount of flow that the Conveyance and Treatment System will discharge to receiving waters through Combined Sewer Overflows in a range of storm events, and the predicted frequencies and volumes of Combined Sewer Overflows from each Combined Sewer Outfall;

c. the predicted amount of Pollutant loadings from Combined Sewer Outfalls;

d. the identity of each physical modification that will be made to the Regional Collection System and a description of the modification providing:

(i) the additional conveyance capacity (in MGD) in the Regional Collection System that will result from the modification;

(ii) the reduction in Combined Sewer Overflow Pollutant load(s) to be achieved by the modification;

(iii) all flow limits, including anticipated flow volumes at each Point of Connection, upon which the proposed modification relies; and

(iv) best management practices upon which satisfactory performance of the modification relies; and

e. the impact of the remedial controls and remedial activities on the protection of Sensitive Areas.

6. ALCOSAN shall include, with input from each Customer Municipality pursuant to Section VI, Subsection N (Coordination with Customer Municipalities):

a. the total population forecasts for the area that is tributary to each Point of Connection, and the estimated amount of total gallons per day and, if available, in gallons per-day-per-inch-mile of sewer line, that each Point of Connection will contribute to the Conveyance and Treatment System, upon implementation of the Wet Weather Plan;

b. a determination of the flows from both the contributing Combined Sewer System and/or the Sanitary Sewer System at each Point of Connection, a description of how each such determination was made, and a description of how such flows will be managed and/or maintained at each Point of Connection; and

c. a program for managing contributions from each Customer Municipality so that such contributions to the Conveyance and Treatment System do not result in exceedances of system capacity and do not preclude attainment with all applicable Water Quality Standards.

7. Based on the evaluations required by this Appendix and Section VI (Clean Water Act Remedial Controls and Remedial Activities), ALCOSAN shall submit a proposal to EPA and PADEP for review and approval, and to ACHD for review and comment, in accordance with Section VIII (Review and Approval of Submittals), identifying those remedial controls and remedial activities will best achieve the requirements of Paragraphs 16 through 18 of the Consent Decree. Within this proposal, ALCOSAN shall identify which of these remedial controls it proposes to construct and which of these remedial activities it proposes to implement and shall detail the design criteria and quantifiable performance criteria for those controls and activities. These design criteria and performance criteria shall include, but not be limited to:

a. pumping capacities of Pump Stations;

b. design capacity of storage facilities; and

c. percent removal of specified Pollutants by treatment.

8. ALCOSAN shall describe in its Wet Weather Plan a phased program for constructing the remedial controls and for implementing the proposed remedial activities, including, at a minimum, a schedule and budget for the following phases of construction and implementation for the Conveyance and Treatment System:

a. preliminary design;

b. final design;

c. bidding and bid review, if any;

d. initiation of construction or implementation;

e. initiation of operation for remedial controls; and

f. performance testing.

9. After completing construction of the remedial controls and implementation of the remedial controls and remedial activities pursuant to the approved Wet Weather Plan, ALCOSAN shall, on an annual basis, submit to EPA and PADEP for review and approval proposed best management practices for the operation and maintenance of each remedial control and each remedial activity implemented for the first time in the year in question. Upon approval by EPA and PADEP in accordance with Section VIII (Review and Approval of Submittals),

ALCOSAN shall incorporate the best management practices shall be incorporated into ALCOSAN's Operation and Maintenance Manuals.

APPENDIX W

Reporting Form

ALCOSAN DRY WEATHER DISCHARGE FACSIMILE REPORTING FORM

DATE OF DISCOVERY BEGIN END	TIME OF DISCOVERY BEGIN END
LOCATION OF OVERFLOW (street address, diversion structure ID):	
ANY PREVIOUS OVERFLOWS AT THIS LOCATION? ☐ YES ☐ NO	ESTIMATED DURATION OF OVERFLOW: HOURS
ESTIMATED TOTAL VOLUME RELEASED:_____ GALLONS	
	DESTINATION OF OVERFLOW (e.g. building, basement, ground, storm sewer to stream, directly to stream):
SPECIFIC RECEIVING WATERS AFFECTED:	
SEWER SYSTEM COMPONENT FROM WHICH OVERFLOW OCCURRED (M = manhole; P = pipe; C = constructed overflow; PS = Pump Station; O = other)	
CAUSE OF OVERFLOW G = grease problem; R = roots; S = sediment; B = other blockages; D = deterioration of line due to aging system or lack of repair; F 1= equipment failure, structural failure or power failure; 3 = 3rd party action including vandalism; O = other, please describe)	SPECIFIC DESCRIPTION OF CAUSE:
STEPS/ACTION TAKEN TO MINIMIZE/ELIMINATE OVERFLOW (where appropriate):	
STEPS/ACTION TAKEN FOR CLEAN-UP (where appropriate):	
DESCRIBE IMPACTS OF OVERFLOW ON WATER QUALITY:	
REPORT MADE TO PADEP (check permit for reporting requirements) DATE TIME	
PERSON COMPLETING FORM NAME TITLE	
CONTACT PERSON NAME PHONE NUMBER	